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Transport Ministry Amalgamation

THERE will be a debate in the House of Commons next week on a draft Order to provide for the transfer on October 1 of the present functions of the Minister of Civil Aviation to the Minister of Transport, who would be known in future as the Minister of Transport and Civil Aviation. Mr. Alan Lennox-Boyd already holds both offices, but the two ministries are themselves physically separate. The decision to amalgamate them was announced by Sir Winston Churchill in February. Commenting on the proposal at the time, we remarked on the advantages of air and surface transport being considered as a single problem, and last week's White Paper (Cmd. 8883) on the amalgamation also draws attention to the balance of advantage now lying in a closer association, under one Minister and in one department, of civil aviation with the older forms of transport. The conditions which have made such a step practicable are the post-war restoration of the country's civil aviation activities to a level where they no longer need the undivided attention of a single Minister. Henceforth the preoccupations of civil aviation will be less concerned with the technical problems peculiar to itself, and more with the fitting of it into its proper place in the transport economy of the country. It is obvious that there is room for every efficient method of transport in the country today, and the proposed merger of the Ministries may ensure a wiser development than occurred when the internal combustion engine made its challenge on the ground. The White Paper foresees a limited measure of staff economies arising from the amalgamation through the integration of common services such as establishments, accounts, and similar duties, all of which are now separately organised and controlled. There may also, it is stated, be scope for some small saving in accommodation. It is, however, on the national rather than the domestic plane, that the benefits of the amalgamation will be expected.

British Railways Building Programme

THE locomotive and rolling stock construction programme of British Railways for 1953 comprises 288 locomotives, 1,448 coaches and 42,641 wagons. The locomotives will include 209 steam, 1 main-line diesel-electric, 51 standard diesel-electric shunters, 14 diesel-mechanical shunters, and 13 electric locomotives for the Manchester-Sheffield-Wath services. Of the last named, six will be Bo-Bo mixed traffic machines and seven will be of the Co-Co type for fast passenger services. Various recent developments in traction motor suspension are being incorporated in these express electric locomotives to improve riding and minimise wear of track at speed. New British Railways standard designs will be represented by 150 locomotives and will include the first 10 of class "9," a 2-10-0 which is the first standard type designed exclusively for heavy freight traffic and is the most powerful locomotive yet designed by the unified British Railways. Most of the carriages will be of new standard all-steel designs but will also include 292 regional non-corridor types. The wagon programme includes 1,200 wagons of capacities from 12 to 42 tons for carrying steel—a useful contribution to movement and distribution of the record quantities now being produced. Vacuum brakes will be fitted to 25 per cent of the wagons, including most of the general merchandise types.

Harrow Signalman Not to Blame

THE unusually serious consequences of the Harrow accident of October 8, 1952, the second worst ever known in Great Britain, have caused Lt.-Colonel G. R. S. Wilson's report, issued yesterday, to be awaited with particular interest. The initial collision, of course, formed the main subject of his investigation, the second arising merely from the regrettable near presence of the down express on the adjoining line. He had felt it his duty to announce quite early (as reported in our October 24 issue) that it was due solely to the express from Perth overrunning distant, inner home and outer home signals. It appears that a violent brake application was made at the last moment, probably when the driver noticed the inner home, or saw the train in front of him. The report establishes that the signalling arrangements, particularly complete for a manually signalled area, were in thorough order. The possibility of a false green light in the colour-light distant can be dismissed absolutely, as can any suggestion that the signalman altered the precedence of the trains or changed the route. The one point on which there was some discordance of evidence was the degree of visibility obtaining, with some fog drifting here and there, but it is clear that when the Perth train was accepted to the outer home it was considerably greater than the regulations required. In no respect can the signalman's conduct be criticised and Colonel Wilson exonerates him completely from any responsibility for the disaster.

Human Failure on the Footplate

EXACTLY what form the driver's failure took can only be conjectured, but Colonel Wilson considers that sudden illness, or a mechanical footplate accident, may be ruled out and that in all probability the driver allowed his attention to relax for a moment, missed the distant signal, and then was expecting to come upon it, finally realising the position much too late. The most important part of his report necessarily follows from that. It sets

out in detail the course of the development of the automatic train control position in Great Britain to date, and shows that during the years 1912-1952 some 10 per cent of all "train" accidents responsible—including Harrow—for 399 fatalities, or 28 per cent of all fatalities in such accidents, might have been prevented or mitigated by a "warning" type of control. The Railway Executive, on taking over, had recognised that the adoption of something suited to all lines in the country ought to be proceeded with, concurrently with other signalling work, and initiated a course of action, resulting in extensive trials of an inductive design, now awaiting final definite approval. Colonel Wilson recommends that all available resources be now directed to carrying out the Executive's 5-year plan, estimated to cost £7,500,000, as part of its long-term one, the total figure for which is £17,300,000, and that no financial considerations be allowed to stand in the way. The full plan would cover all main lines carrying a heavy passenger traffic. This, however, should be "without prejudice to other necessary signalling work." It is as well to note, to emphasise the constant need for keeping a sense of proportion in this matter, that—Harrow excepted—train accidents in 1952 involved only one passenger fatality.

"Elizabethan" to Scotland

REACHING Waverley ahead of time on its first run last Monday, the "Elizabethan" auspiciously launched the new 6¼ hr. non-stop service between the two capitals by the East Coast route. The smoothness of the running at speeds up to the 90 m.p.h. maximum reached north of Hitchin drew appreciative comment from both official and ordinary travellers. The "Elizabethan" is the first train to convey passengers paying standard fares so swiftly between the two capital cities. Only the pre-war "Coronation" regularly covered the route faster, but it was a hundred tons lighter, and carried fewer passengers, who paid a supplementary fare. The "Elizabethan" makes no extra charge for its speed and amenities, which include both restaurant and buffet cars and ladies' retiring rooms. The longer established services also are faster this summer; the "Flying Scotsman" reaches Edinburgh eleven minutes earlier and the "Aberdonian" ten minutes earlier than last year, an all-round acceleration in accordance with the British Railways policy of raising the general level of express speeds in preference to introducing a few high-speed, extra-fare trains. Leaving Kings Cross at 9.35 a.m. and reaching Edinburgh at 4.20 p.m. and Aberdeen at 8.38 p.m., the "Elizabethan" has a schedule which should attract ample patronage and ensure the success of a commendable venture. The inaugural run and the welcome to the train at Edinburgh are reported on another page.

The "Princess Victoria" Report

ALTHOUGH the findings of the Court of Inquiry into the loss of the British Railways vessel *Princess Victoria* were made known on June 11 and summarised in our June 19 issue, the report of the Court was not published until last Tuesday. This document has the unusual feature of including an addendum by one of the assessors, Professor A. M. Robb, which in developing his previous separate answers to two of the questions, somewhat modifies the impressions already gained from the findings of the other members of the Court. In particular Professor Robb considers that the temporary repairs to the stern doors of the ship, after being damaged by heavy seas in November, 1951, did not suggest serious damage. In the circumstances he feels that the owners and managers (the British Transport Commission) did not receive sufficient indication of the weakness of the stern doors to justify the conclusion that they were in default in not adopting measures to strengthen them. While the owners and managers were at fault in not reporting the incident, it is considered that the failure to report should not be taken as a cause of the loss of the ship, and while Professor Robb holds that the primary cause of the loss of life was default of the owners and managers, a contributory cause was default on the part of the complement of the ship.

Developing Traffic in Ceylon

EXPANSION of existing co-ordinated rail-road services during the year ended September 30 last have led the Ceylon Government Railway to consider extending similar facilities. At present there are five services of this type for goods traffic, connecting with the railway system at nineteen stations. A total of 349,479 tons was conveyed by this organisation in 1951-52, and it is now proposed to increase the facilities in the north of the island, and to establish a new 25-mile route in connection with the Gal-Oya agricultural scheme in the east. There are also co-ordinated road-rail services for passengers, provided by bus operators under agreements with the railway. These are popular among tourists from India, and a further attraction for tourist travel is the running of party excursions at cheap rates in diesel-electric stock specially equipped for this purpose. A vehicle used for such services was illustrated in our publication "Overseas Railways, 1952." Despite a continued upward trend in passenger and freight traffic during the year, however, bringing an increase of Rs. 4,930,392 in gross receipts, the deficit increased from Rs. 6,763,172 to Rs. 12,310,443, the result of high materials and wages costs.

Re-equipping Brazilian Railways

THE Leopoldina Railway is to undergo great changes if the recommendations of the Brazil-United States Commission are carried out. Loans of more than $20,000,000 from Washington banks are to finance improvements to it and eight other Brazilian railways. The administration and accountancy system of the Leopoldina are to be revised and the staff drastically reduced. Almost 100 miles of main line on the Petropolis and Friburgo sections, which accounted for 43 per cent of the 1951 deficit, and seven other small sections totalling 180 miles are to be abandoned. On the other hand, a section of the Central Railway and the Jacutinga-Arantes section of the Rede Mineira are to be transferred to the Leopoldina to obviate transhipment of goods. It is proposed to acquire 700 wagons and 100 coaches, considerable quantities of brake gear and automatic couplers, and signalling equipment. The U.S.A. has already granted, or is about to grant, credits for re-equipping the Central, Santos-Jundiai and Paulista railways, but there has been delay in opening the credits recommended by the Commission for financing the first stage of urgent works on the Noroeste, Parana-Santa Catarina, and Rede Mineira railways. The Brazilian National Bank for Economic Development therefore is to finance them and the total to be spent in Brazil is estimated at £32,480,000.

Tests of British Railways Class "7" Locomotive

BRITISH RAILWAYS have recently published bulletin No. 5 which gives the result of performance and efficiency tests with the class "7" standard locomotive, the first type to be placed in service under the Railway Executive's new locomotive standardisation policy. Earlier tests on non-standard locomotives formed the subject of a series of articles published in our October 10, 17, and 24, 1952, issues. As in previous tests two types of coal were used, and trials were carried out with a dynamometer car, and on Rugby Test Plant. The road test not only covered the normal working range of the locomotive, but went well above any rate of working at present required in practice. The data given relate to the practical application of the results in formulating economic train schedules, bringing out at the same time several interesting features of performance. Interest centres on the large boiler provided, the maximum capacity of which was deliberately limited by draughting arrangements, which are such as to promote economical combustion at normal rates of working. Nevertheless it is sufficient for a continuously sustained evaporation of

30,200 lb./hr. of feedwater and for as much as 36,150 lb./hr., maintained for ¾ hr. on the road, values beyond the capacity of a single fireman.

Efficiency of Locomotive Boilers

A CARDINAL consideration in the performance of a steam locomotive must always be the steaming capacity of the boiler. No matter how good an engine may be in other respects, nothing can atone for indifferent steaming; that is axiomatic. An article appearing elsewhere in this issue will be found of interest as giving an account of the evaporative performance of a modern locomotive boiler using two different qualities of coal. The fact that the boiler in question is one fitted to one of the new British Railways standard engines will no doubt provide an added interest to the operating results disclosed. From the point of view of thermal efficiency, this boiler is seen to be almost equally efficient when either of the two different qualities of coal is fired, which must be regarded as being very satisfactory for a standard design which may be required to use different qualities of coal according to the Region in which it is operating. On the other hand a further point brought out is that when using either of the two qualities of coal, the potential steaming capacity of the boiler could not be reached. This is, it would seem, due to the draughting arrangements not being capable of supplying the necessary air for combustion.

Sir Michael Barrington-Ward

THE retirement of Sir Michael Barrington-Ward in September will be a milestone in railway operating history. Up to 1939 his activity and influence in operating matters were largely concentrated on the Southern Area of the L.N.E.R. Between 1939 and 1945, as Chairman of the Operating Committee of the R.E.C., he, with his colleagues on each of the four groups, was responsible for the wartime operating achievements of the British railways that were quite outstanding. Between 1948 and 1953 he has applied his mature views on railway operating to all the railways of Britain. It is by all this operating work that he will be judged by railwaymen—not as a Divisional General Manager of the Southern Area of the L.N.E.R (1945-47) or as a Corporate Member of the Railway Executive (1947-53) which took over the general management of the railways on nationalisation. His life's work has been spent in the field of railway operating.

The reorganisation of British Railways under the Transport Act of 1953 may bring changes in the operating department, but it is not likely that much of Sir Michael Barrington-Ward's work on standard practice since 1948 will be fundamentally altered. The decision to form an independent department for motive power; the division of responsibility between the operating and commercial departments; the organisation of the operating department itself by breaking down each operating area into districts in charge of district operating superintendents and the arrangement of the work therein; the re-statement of the basic principles to be observed in the control offices, rolling stock control and distribution; the operating statistics to be used; the organisation of the motive power department; locomotive fuelling and repairs—these are some of the matters to which he has given his attention.

The standardisation of organisation and methods of operating throughout the railways could not have been accomplished without breaking down tradition with a complete recasting of operating practices. Railway operating being an absolute fundamental, on which practically everyone in the railway service has views, it was unlikely that there would be general agreement on all Sir Michael Barrington-Ward's decisions and methods. Moreover, although his main aim was to place a severe limit on centralisation at the Railway Executive, by laying down at the Executive only the principles, methods, and practices to be adopted in the operating and motive power departments, leaving their application to the regional operating and motive power superintendents, his general and logical conception of functional Executive work has not always satisfied the chief regional officers.

Perhaps the most thorny of all matters on which he has been concerned is that of regional boundaries, *i.e.*, whether for operating purposes it is possible to arrange the organisation on a geographical regional plan or whether it must be arranged on a lineal basis without regard to such boundaries. Sir Michael Barrington-Ward argues that the speed and efficiency with which train working can be handled is largely determined by the extent to which the operating districts can be designed to conform to the principal traffic flows and for this reason they must be arranged on a lineal basis. Any attempt to rearrange them on a regional or geographical basis would increase considerably the number of districts dealing with the same streams of traffic. It is from arguments such as these that the " penetrating line " device has developed.

Seeing Sir Michael Barrington-Ward one would not think that his retirement from the railway service is imminent. A man is as young as he feels, and he is younger than a good many of fewer years. No doubt he will remain in active business life for many years yet, for he has merely reached maturity in experience of industrial organisation and of life.

The Framework of Public Transport

THE general conclusion reached by Sir Reginald Wilson, Comptroller of the British Transport Commission, in his paper " The Framework of Public Transport," read last Wednesday at the Institute of Transport Congress in Glasgow, is that the degree of obligation involved in the provision of any regular transport service, of whatever nature, normally will make such a regular service highly vulnerable to the free-lance operator. This is true, he states, whether the regular public service is provided by a publicly-owned or a privately-owned undertaking, and all forms of transport are to some extent affected by this need of protection and the consequential necessity for regulation.

To the " complex and shifting " problems involved in regulating monopoly, which he assumes to be a less desirable alternative than competition, of combating undue size, and in controlling incentive, Sir Reginald Wilson says there is no easy or spectacular solution; certainly neither complete public monopoly nor wholesale private competition, taken by itself, will provide the answer. What he calls " a sensitive handling " of the problems must, he thinks, entail a continuous effort of " practical and non-political administration carried on within a framework of constitution and public regulation which must be non-sectional, well-instructed, and fair." Whatever views may be held on the present framework of constitution and regulation of public transport in Britain, it could hardly be claimed that its administration, in the broadest sense of that word, has been free from political considerations at least where the central Government has intervened.

The sub-title of the paper reads: " with special reference to the problems of monopoly, undue size, and incentives "; with these Sir Reginald Wilson deals at some length. He draws attention to the impossibility of a pure monopoly, partly because the provision of highways and communications cannot be left entirely " to the unstimulated and unregulated energies of its citizens individually " and because regularity in a transport service necessitates a high degree of planning. He draws a clear distinction between the cartel and the trust, between the selling and the production monopoly, and stresses that some monopolies may depend not on ownership mut on unwritten understandings, and so on. His estimate of the revenues in 1951 from internal public transport may surprise many: of a total of £809 million, nearly half (£360 million) is shown by him as derived from passenger traffic. The largest single element in the latter is from country buses (£74 million), followed by provincial, urban, and suburban road transport, with British Railways long-distance passenger receipts (£56 million) a poor third. It would be wrong, however, on the basis of the figures given,

to underestimate the significance and enormous size of British Railways passenger business, and especially the vital part played not only by long-distance and suburban, but also by many country (" mid-distance ") services, especially in view of the railways' obligation to provide services.

Long-distance passenger transport he considers as lines rather than networks, and they might seem to offer greater scope for competition than urban transport. Nevertheless there is a tendency for long-distance road transport operators when demanding freedom from licensing to mean in effect " Let me inside, and shut the doors behind me." As to competition between long-distance railway and road passenger services, Sir Reginald Wilson foresees difficulties in the railways reducing fares towards the low level of actual costs in long-distance train operation. It may be urged that the railways be relieved of some of their obligations and that the responsibility for meeting marginal traffic services be shared by the road passenger operators. Both these courses, he states, are impracticable, the first because of the public interest and the second because of the limited resources of the average motorcoach operator. He does not, however, enter into the problem of withdrawing unremunerative pasenger train services as it now affects the travelling public—though admittedly on a very small scale. Long-distance road services must continue, he thinks, to be governed by the licensing system. More, perhaps, might be said of a division of traffic between rail and road in the form of road feeder services to passenger " railheads," though presumably in many cases bus operators would not find this attractive. Air competition for services within Britain he shows to be largely a matter of subsidy, including subsidy of the internal by the longer distance services of British European Airways. Competition between the railways for passenger traffic in this country he dismisses with a reference to pooling before nationalisation. Nevertheless, if largely for reasons of prestige, competition at least up to 1939 certainly tended to improve services.

Even although size in a railway may be thought a handicap—the four main-line companies before nationalisation were thought by many to be too big—the difficulties of keeping a self-contained railway, with its many ancillaries, to a reasonably small size, are emphasised by Sir Reginald Wilson; he also stresses the large size of the Association of American Railroads organisation necessary to co-ordinate the activities of 150 separate railways in the U.S.A.

The share of British Railways, only £263 million of the £449 million calculated as derived from freight traffic in 1951, may seem surprisingly low; and of this £120 million was from " coal and heavy materials," with as much as £13 million in this category received by the road operators. Here again he is in favour of regulation, for which he gives his reasons in a closely-reasoned argument. On unfettered road and rail competition he says " In a really free road haulage world there might be an almost inexhaustible supply of fresh candidates for the slaughter (of small road hauliers) and the railways might not be able to support the position in perpetuity."

On the question of the general structure of the inland transport industry of Britain he advocates unified policy at top level and co-ordinated and impartial regulation. He stresses the difficulty of assessing " track cost "; and he shows why road transport is supported by powerful pressure groups. The transport industry remains divided against itself being split into factions by forms of transport: " who benefits from this is not clear, but it can hardly be the ordinary customer. So far as sectionalism produces competition over a great part of the field the competition is merely between big monopolists for border territories." This statement he explains by a diagram showing the fields of transport and the several producers in relation to degrees of regulation.

Regulation public services, he concludes, are essential to national existence, but we shall not have them unless we organise for them and protect them. Creation of monopoly or partial monopoly of various forms is essential, unless there is a natural monopoly already. Where, then, the competition is non-existent or very imperfect, which in these services must be the case, a proper share of the obligations of public service (or something in lieu thereof) must be imposed by regulation on those who work in this field and enjoy the benefits of monopoly, complete or partial.

If it is thought that the road services classified as regular public services must present too great a problem of regulation, the answer is that the necessary framework of regulation already exists on the passenger side, where there are many individual entities concerned. Admittedly it is more difficult to regulate freight services.

Assuming the distinction between the area of freedom and the area of regulation to have been established, the process of regulation *must* be carried out by somebody, and is not impossible. The alternative is to abandon the freight side to a " free-for-all." The opinion of transport producers seems to be against such an alternative, and so does the opinion of most of the users of freight transport, who do not seem willing, when it comes to the point, to dispense with regular and organised public services, especially for non-bulk consignments.

British Transport Commission Traffic Receipts

WHITSUNTIDE and the Coronation much affected traffics during Period 6, the four weeks ended June 14. British Railways coal class traffic receipts at £7,596,000 compare with £8,764,000 for the preceding period, and their slight excess over the corresponding figure for 1952 is considerably less than the 5 per cent rise in rates during the past twelve months. Similarly mineral traffic receipts were £3,257,000, against £3,574,000 for Period 5, with a decline in tonnage compared with last year. Merchandise receipts not only were down on those for Period 5, but show an absolute decline on the 1952 figure, which though small indicates a considerable drop in traffics in view of the 5 per cent rate increase.

—	Four weeks to June 14		Incr. or decr.	Aggregate for 24 weeks		Incr. of decr.
	1953	1952		1953	1952	
	£000	£000		£000	£000	
British Railways—						
Passengers	10,055	9,560	+ 495	46,423	45,083	+ 1,340
Parcels, etc., by passenger train	2,940	2,763	+ 177	17,097	16,073	+ 1,024
Merchandise & livestock	7,790	7,877	− 87	50,301	49,750	+ 551
Minerals	3,257	3,135	+ 122	21,084	19,332	+ 1,752
Coal & coke	7,596	7,396	+ 200	51,150	47,570	+ 3,580
Total British Railways ...	31,638	30,731	+ 907	186,055	177,808	+ 8,247
British Railways C. & D. ...	857	839	+ 18	5,331	5,257	+ 74
British Road Services ...	5,700	5,709	− 9	35,913	35,668	+ 245
Road Passenger Transport : Provincial & Scottish ...	3,989	3,926	+ 63	20,639	19,569	+ 1,070
London Transport—						
Railways	1,471	1,408	+ 63	8,309	8,098	+ 211
Buses & coaches ...	3,332	3,217	+ 115	18,140	17,322	+ 818
Trolleybuses & trams ...	719	780	− 61	4,165	4,433	− 268
Total London Transport	5,522	5,405	+ 117	30,614	29,853	+ 761
Ships...	958	995	− 37	4,140	4,256	− 116
Inland Waterways : Carrying—						
Freight charges	74	73	+ 1	425	412	+ 13
Total from passengers ...	20,034	19,377	+ 657	99,306	96,125	+ 3,181
Total from freight, parcels & mails	28,704	28,301	+ 403	183,811	176,698	+ 7,113
TOTAL FROM CARRYING ACTIVITIES ...	48,738	47,678	+ 1,060	283,117	272,823	10,294

Because of the alterations in fares since last year, it is not possible to assess the effects of the Coronation on British Railways and London Transport passenger receipts. The Whitsun holiday fell in Period 6 both last year and this, and the weather this year was good compared with 1952. The two holidays this year would account for British Railways passenger receipts at £10,055,000 so much exceeding the £7,737,000 for Period 5, whilst some seasonal increase

must be expected in any case. Taking into account the Whitsun weather, the relatively small increase over last year is disappointing. London Transport railway receipts likewise show only a small increase over the 1952 figure, with a disappointingly small rise of £100,000 compared with Period 5.

London Transport bus and motorcoach receipts at £3,332,000 were only slightly above those for last year and the preceding four weeks, so that the Coronation brought little benefit in the way of traffic, as was announced. The B.T.C. provincial and Scottish bus receipts were well up on Period 5, but virtually the same as for Period 6 of last year. The factors involved are complex; one is the high proportion of these undertakings' receipts stated to be derived from stage carriage as against motorcoach traffic, so that in this case also the Coronation seems to have created relatively little traffic.

In the circumstances, British Road Services receipts of £5,700,000, almost the same as for Period 6 of 1952, and comparing well with Period 5 in view of the holidays, are very creditable. The aggregate moreover for the 24 weeks of this year remains above last year's figure. Ship receipts at £958,000 show a decrease compared with last year. No comment is possible, because of the varying proportions of the receipts derived from passengers and cargo and from the several shipping services; in the aggregate for the year to date, there is a slight decline compared with 1952.

PERCENTAGE VARIATION 1953 COMPARED WITH 1952

	Four weeks to June 14	Twenty-four weeks to June 14
British Railways—		
Passengers	+ 5·1	+ 2·9
Parcels	+ 6·4	+ 6·3
Merchandise & livestock	− 1·1	+ 1·1
Minerals	+ 3·8	+ 9·0
Coal & coke	+ 2·7	+ 7·5
Total	+ 2·9	+ 4·6
C. & D. Services	+ 2·1	+ 1·4
Ships	− 3·7	− 2·7
British Road Services	− 0·1	+ 0·7
Road Passenger Transport	+ 1·6	+ 5·4
London Transport—		
Railways	+ 4·4	+ 2·6
Buses & coaches	+ 3·5	+ 4·7
Trolleybuses & trams	− 7·8	− 6·0
Total	+ 2·1	+ 2·5
Inland Waterways	+ 1·1	+ 2·1
Aggregate	+ 2·2	+ 3·7

French National Railways in 1952

THE General Manager of the French National Railways, Monsieur Louis Armand, has outlined in a brochure "Activité et Productivité de la S.N.C.F. en 1952" the progress made last year by his system in achieving greater efficiency and output. Passenger traffic shows an increase in the average length of journeys on main lines, but a fall in Paris suburban traffic; this is in accordance with recent trends, the decline in short-distance travel being due to the increasing competition with road transport, both bus and private car. Summer peak traffic again increased in 1952, which adds to operating difficulties. Last Christmas departures from Paris termini were 7 per cent down on the previous year, but there was no decrease in long-distance travel to winter sports resorts, and traffic increased slightly to Riviera, Alpine, and other destinations served by the South Eastern Region. The average charge for conveying one passenger one kilometre in 1952 was 16·8 times what it was in 1938, while the index of average retail prices was 24·6 against 1938. Account, however, must be taken of the 25 per cent increase in fares on May 15, 1953.

Freight fell off in the second half of the year, mainly in agricultural traffic and smalls, which has resulted in the diminution in the financial yield per *tonne*-kw. Despite rate increases, the average rate for one *tonne*-kw. in 1952 was 18·5 times the 1938 figure, Monsieur Armand points out, whereas the index of average wholesale prices last year was 26·8 compared with 1938. The following are some of the principal results:—

—	1938	1951	1952
Passenger journeys (millions)	540	549	540
Average journey (km.)	41	51	53
Goods tonnage conveyed (millions)	132	177	173
Average wagonload (*tonnes*)	9·0	13·1	13·6
Tonne-km. conveyed per man-hour (incl. tare weights of vehicles)	165	194	197

Reduction in the railway staff was continued in 1952, with a drop of 14,000 to a total of 415,800, or, as at December 31, 1952, 69,400 less than on December 31, 1947. This was achieved by use of more powerful steam locomotives, electrification and dieselisation, and improved operating methods. Thus on the administrative side there were important reorganisations of various departments, and during the year 200 level crossings were equipped with automatic signalling and warning devices. Productivity in 1952 in terms of man-hours was over one-third more than in 1938. Despite this, the early retiring age places a heavy burden of pensions on the S.N.C.F.

Productivity was aided partly by electrification of the Paris-Lyons main line, with the effects described from time to time in this journal. Nevertheless, an all-round effort to improve working methods has been largely responsible for achievements such as the 112,300 *tonne*-km. per wagon, twice the 1938 figure. Even with allowance made for the superior quality and increased capacity of the most recent types of wagon, improved turnround and better loads represent a marked reduction in immobilised capital. Last year the *tonne*-kilometrage was 44·3 thousand million with 410,000 wagons, against 41·8 thousand million with 540,000 wagons in 1929.

Recent improvements in passenger and goods services already have been described in these pages. One of the most remarkable is that in passenger train punctuality: in 1952, 4·2 per cent of long-distance trains were 15 or more minutes, and 0·9 per cent of Paris suburban trains were more than five minutes late. The number of accidents involving trains was 2·8 per million train km. in 1952, against 3·3 the preceding year, which was the best since the war.

No major step towards co-ordination of rail and other means of transport was taken in 1952, though the existing system was extended in certain areas. Without drawing premature conclusions as to this system it is stated that economies effected amount to 25 per cent of previous expenditure. Use of road-rail trailers has been extended, and this means of transport has been shown generally to be the most efficient, as regards cost of production, for distances of 250 km. and over. The formation and extension of the "Europ" wagon pool has played an important part in enhancing the efficiency of rail transport both in France and in other European countries.

The deficit of 93,000 million francs (say £93 million), or 17 per cent of S.N.C.F. expenditure, for 1952 is described as the inevitable consequence of a policy of cheap transport. Monsieur Armand stresses that the statutory basis of French National Railways finances makes insufficient allowances for the railways' public obligations. A step towards a more rational system was taken on July 19, 1952, when the Government agreed to assume certain obligations in the upkeep and renewal of the permanent way. Calculated on the basis of the regulations now in force the deficit in receipts in 1952 would be about 30 thousand million francs (£30 million), or 5·8 per cent of total expenditure. For 1951, the last year for which full accounts are available, total receipts were 451·7 thousand million and net traffic receipts 6·4 thousand million francs; charges amounted to 14·3 thousand million, resulting in a deficit of 7·9 thousand million francs (£7·9 million); this shows that apart from the burden of charges, there was efficiency in management within the limits of statutory charges and restricted capital expenditure.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Diesel Traction on British Railways

June 24

SIR,—I have been interested in your articles dealing with the development of diesel traction which have been published from time to time and, like many more, I have been under the impression that the London Midland Region and former L.M.S.R. were the pioneers of this form of traction. I read, therefore, with some surprise on pages 5 and 6 in the Fifth Annual Report of the B.T.C. (1952), that the main-line diesel locomotives have been concentrated in the Southern Region "in order to concentrate maintenance under an experienced staff."

Are we to assume that the "five years' useful experience" obtained in the London Midland Region has not been sufficient to produce an experienced maintenance staff and that the Railway Executive has decided to try all over again?

Yours faithfully,

A. P. GOODMAN

The Wyndham Inn, Stoke Road, Plymouth

Rhodes Centenary Exhibition

June 22

SIR,—I note on page 588 of your issue of May 22 that reference is made to the announcement appearing in the *Rhodesia Railways Magazine* for April that a Beyer-Garratt locomotive was to be on view at the Rhodes Centenary Exhibition.

In view of the shortage of engine power to meet current traffic demands it was decided, before the exhibition opened, not to aggravate the position by withdrawing a Garratt from service and the only engine on the Rhodesia Railways stand is a small "Jack Tar" built in 1896, which is of historical interest only.

I should be glad if you would kindly publish these facts in your next issue as we are being particularly insistent on the early delivery of outstanding orders for locomotives from the United Kingdom, and it is desired that there should be no misunderstanding on the part of the makers of our needs.

Yours faithfully,

B. H. JOHNSON,
Assistant General Manager

Rhodesia Railways, Bulawayo

The Decrease in Railborne Merchandise

June 23

SIR,—It is a pity that Mr. Bell in his letter, which you published on June 19, should be led into the rather common assumption that things have altered for the worse in the past five years of reorganisation, and that as a result commercial relations with traders have suffered. As the officer now responsible for such matters in the territory of the old N.E.R. I can assure him that this is not so.

Greatham, the northern centre of the Cerebos activities, was quite untouched by Regional boundary changes and is still in the Middlesbrough Commercial District, so that the firm has precisely the same freight contacts with the railways as it has had for many years. The District Officer, like many of his staff, is a thoroughbred North Eastern man and he has enjoyed during the eight years he has been at Middlesbrough the happiest relations with this important firm, relations which continue to this day. The only change arising indirectly from recent reorganisations has been to bring the passenger affairs of this part of the country under Middlesbrough as well, instead of their being controlled as previously from York, 60 miles away. Only a short while ago the District Office had a happy discussion with the firm about the "Salt-Girls' Train," which still brings its quota of beauty each day from the Hartlepools.

Whatever considerations may lie behind the new transport policy announced by the Cerebos Chairman, and which I regret as much as Mr. Bell, it would appear to originate a long way from Greatham, and is certainly not due to any weakening of the links which the Commercial Department of the N.E. Region has with its traders. In fact, Mr. Bell's remarks need to be taken *cum grano salis*.

Yours faithfully,

E. W. ARKLE,
Commercial Superintendent

North Eastern Region, York

Summer Timetables

June 5

SIR,—Referring to Mr. H. W. Franklin's defence of the difficulties of planning in regard to the Summer timetables, allow me to say that generally there is plenty of scope for improved and cheaper rail facilities. As one practical and economic step to this end the railways should be freed from the domination of the British Transport Commission.

Yours truly,

ROBERT W. LEWIS

104, Leggatts Way, Watford

Western Region Suburban Services

June 27

SIR,—In discussing the Western Region summer timetables in your May 15 issue no mention is made of improvements to suburban services, but the efficiency of a system should surely be judged by its worst, rather than its best, services.

Consider for example the down p.m. peak service at 5-6 p.m. between Ealing Broadway and Slough, two fairly important interchange stations:—

Ealing dep.	Slough arr.	Av. speed, m.p.h.
5.05	5.47	18·2
5.17	5.58	18·7
5.43	6.22	19·6
6.00	6.37	20·7

Total distance 12¼ miles. All trains stop at all intermediate stations, of which there are only seven.

This parochial case of a G.W.R. legacy to British Railways is not, I hope, typical of the service provided for the daily suburban traveller. It is little comfort for him to know that he can now get from Paddington to Penzance in 40 min. less than last year. He doesn't want to. The possibility that more semi-fast trains may have to be diverted from the main to the relief lines when the new faster expresses are running late, to make his slow train even slower, is however a much closer reality to the all-stations traveller.

Re-examination and tightening of suburban schedules, reduction of excessive booked station stops, better connections, or more semi-fast trains would surely do much to earn the goodwill of the daily travelling public and stimulate traffic.

Yours faithfully,

D. T. CATLING

Abbey Cottage,
Poyle Lane, Burnham, Bucks

RAILWAY BENEVOLENT INSTITUTION.—At a meeting on June 24, the Board of the Railway Benevolent Institution granted annuities to four widows and seven members involving an additional annual liability of £209 6s. Forty-eight gratuities were also granted amounting to £585 10s. to meet cases of immediate necessity. Grants made from the Casualty Fund in May amounted to £722 5s.

THE SCRAP HEAP

Featherweight Flyer

At Kings Cross (on June 29) there was an official send-off of the "Elizabethan" — the Railway Executive Chairman, Mr. John Elliot, a host of officials and railway foremen.

They stood round the 15-ton, 4-6-2 streamlined locomotive, the *Walter K. Whygham*, like eager engine-spotters.—*From the "Daily Mail."*

What a Bore

At first sight the Woodhead new tunnel, which penetrates the Pennines between Manchester and Sheffield, might be taken for an English variant of the Pyramids, a vast, senseless fatigue ordered by some tyrant with a preference for the less ostentatious type of monument. A lofty tube of air, three miles and 66 yards long, has been inserted into the rock that separates the hamlet of Dunford Bridge from Woodhead, and for the next year or so will remain a profitless vacancy.—*From "The Manchester Guardian."*

U.S. Atlantic Preserved

It is appropriate that the country of origin of the Atlantic wheel arrangement should be taking steps to preserve examples of the type. One noteworthy example of the 4-4-2 design was the Southern Pacific "3000" class built in 1904, one of which is illustrated. No. 3057, seen in our illustration, was one of the last four survivors, but the longest-lived of the class was No. 3025, which was not withdrawn until early this year. This engine has been presented to the City of Los Angeles and is now placed on permanent display in Griffith Park Museum, where it is now part of an unique Travel Town exhibit.

No. 3025 is noteworthy in having been assigned to many Presidential special trains, conveying Theodore Roosevelt, William H. Taft, and Woodrow Wilson, and also hauled a special train conveying Queen Marie of Rumania. These notable Atlantics had cylinders 20 in. dia. by 28 in. stroke, driving wheels 6 ft. 9 in. dia., and a working pressure of 210 lb. per sq. in. Weight of engine in road order was 230,500 lb. and tractive effort 24,680 lb. In 1946 two of the class were painted in "Daylight" colours and assigned to hauling Sacramento "Daylight" trains.

Canadian National Coronation Menus

To celebrate the Coronation, the Canadian National Railways Dining Car Department arranged for printing of three special souvenir menu covers with Coronation *motifs* in colour. One

C. N. R. Coronation Menu

is depicted above, another bears a portrait of H.M. the Queen on the front, and the third shows St. Edward's Crown. The back in one case shows the Coronation Chair, and, in the other two items of the Regalia.

Bits and Pieces

A special check at South Kensington, L.T.E., Station during the first day's operation of the new threepenny-piece ticket machines showed that 243 threepenny pieces were put into the two District Line machines, and that one passenger in every nine used a threepenny piece to buy his ticket—the others using various combinations of copper and silver.

On the Piccadilly Line one passenger in sixteen inserted a threepenny piece on the first day.—*From the "Daily Mail."*

Unreserved Seat

Passengers using the new seat at Hampton Wick Station have Mr. Percy Martin to thank. . . . A season ticket holder on the Southern Region and its predecessors, for 50 years, Mr. Martin suggested to British Railways that something should be done to mark the occasion and good humouredly said he would appreciate a new seat at Hampton Wick, as the old one put his clothes in jeopardy.

His challenge was accepted in the same spirit by an official at British Railways, and a new seat was installed. Now it is always full and Mr. Martin cannot get a seat.—*From the "Evening Standard."*

Midsummer Madness

It was a summer morning,
A misty morn in June,
When weather-wise spectators
Watch out for the monsoon.

The train was packed with people
En route to see the Test,
When, at a level-crossing,
It stopped to take a rest.

Down in the road the motors
Soon lined up in a queue
And agitated sportsmen
Were asking "What's to do?"

And Colonel Bloggs cried, hoarsely,
"This makes a chap see red, Sir,
"If we don't get a move on soon,
"We may miss Alec Bedser!"

"This dilly-dallying's enough
"To rouse a feller's ire, man,"
But, quite unmoved, the driver went
On wrangling with the fireman.

The fireman wanted to press on,
The driver spoke with unction,
An pandemonium round him ranged,
But still he wouldn't function.

Another engine came at last
To get the train to go,
But what the row was all about
Nobody seemed to know.

Some said the driver wanted
More water for his train,
Others declared the water
Was mostly on his brain.

June is the time for fairies
And strange things may befall
In pixilated moments—
Maybe I dreamed it all!

PRO BONO, ETC.

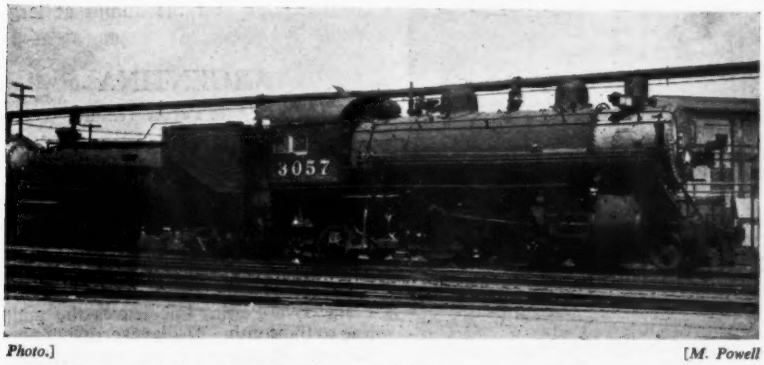


Photo.] [M. Powell

A Southern Pacific "3000" class 4-4-2 locomotive, the last survivor of which is now preserved at Los Angeles

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

WESTERN AUSTRALIA

New Booking Office at Perth

The reconstruction, to the Chief Civil Engineer's design, of the inter-State booking office at Perth Central Station to provide more expeditious service, greater comfort, and pleasant surroundings for passengers on inter-State and long-distance trains, is in progress. The new building will be welcomed by travellers, who in the past have had to stand in long queues from early hours until late in the day to secure a booking on the trans-Australian train.

The foyer of the booking hall will be fitted with upholstered lounge seating to accommodate up to 50 persons. The name of each passenger will be recorded when entering the hall. The booking office is designed to accommodate six booking clerks during peak periods. As it takes an average of 18 min. to dispose of each transaction, during the busiest periods a new customer will be attended to every three minutes.

While the reconstruction is being carried out, inter-State passengers will be attended to at the country booking windows and the inquiry office will be housed in a temporary structure.

VICTORIA

Inaugural Run of Electric Locomotive

On April 26 the first of the new electric locomotives built by the English Electric Co. Ltd. made its inaugural public appearance by hauling the Healesville and Warburton train over the electrified section of the line from Melbourne to Lilydale, 23½ miles.

These locomotives, which were described in our March 20 issue, are destined eventually for the heavy coal and passenger traffic on the Gippsland line but until electrification is complete will be used for other duties. They can be used on the electrified suburban lines and on two electrified lines running to nearer country resorts—the Lilydale line and that to Frankston.

The first section of the Gippsland line to be electrified will be the 60 miles from Melbourne to Warragul, on which work is proceeding rapidly.

Sunday Excursion Trains Again

On Sunday, April 26, the railways began running Sunday excursion trains at specially reduced fares again after a cessation of twelve years. In the early days of the war, because of the staff shortage and the heavy strain imposed on the railways, the running of trains from Melbourne to country centres and *vice versa* was discontinued on Sundays.

UNITED STATES

High-Speed Freight Operation

One of the fastest long-distance freight services scheduled in the United States came into operation on June 10. It has been planned for the conveyance of perishables, chiefly fruit, from California, to the Middle West, and is exclusively for traffic travelling at least as far as Kansas City or Omaha. Two competing routes are involved, those of the Atchison, Topeka & Santa Fe, which has its own metals throughout from Los Angeles to Chicago *via* Kansas City, and the joint Union Pacific and Chicago & North Western, *via* Salt Lake City, Ogden, and Omaha to Chicago. The Union Pacific train will start from San Bernardino, California, and the Santa Fe train either from San Bernardino or Bakersfield, at about 8 p.m., and Chicago will be reached on the afternoon of the third day. This will mean covering a distance of approximately 2,230 miles in 62 hr., at an average of 36 m.p.h. including all stops, some of sufficient length to re-ice all the wagons.

In assessing the 36 m.p.h. speed it must be remembered that the trains of both routes have to be worked over considerable altitudes, the Union Pacific attaining 8,013 ft. altitude at Sherman, and the Santa Fe passing over four summits all exceeding 7,000 ft., the highest of them the 7,573 ft. of Raton tunnel. There will be a surcharge of $1·20 per 100 lb. over the normal freight rates on every consignment carried by these trains.

Diesel Innovations on the Southern

The Southern Railway, which on delivery of 16 road-shunting diesels now on order will become completely diesel-equipped, has introduced several improvements in its diesel operation. One is an automatic control applied to shunting diesels used in its marshalling yards, which automatically keeps the speed of the diesel constant at a predetermined level when the locomotive is moving a train of wagons over a hump.

Another ingenious idea has been to rebuild five steam locomotive tenders with motor-driven bogies, equipped with cooling fans, and with superstructures ballasted with metal to increase the adhesion. Each of these units is then coupled between two 1,000 h.p. shunters, with the motors on one of its bogies in series with those of the shunter at that end of the "booster" unit, and those of the other bogie in series with the motors of the shunter at that end. The generators of the two shunters thus supply current to twelve motored axles in all, increasing the combined tractive effort of the shunters from 2,000 to 3,000 h.p. These economical three-unit combinations are giving valuable service with heavy freight trains over the humps at large Southern yards.

Photo] *[G. Bakewell*

One of the 25 2,400 h.p. mixed-traffic electric locomotives being supplied by the English Electric Co. Ltd. to the Victorian Railways passing Hawthorn on its first run

ARGENTINA

Presidente Perón Viaduct

One of the most important works to be completed since the nationalisation of the railways in 1948 was inaugurated by President Perón on June 4, the tenth anniversary of the revolution of 1943. It is a two-km. long viaduct which bears his name and is situated in Sarandí, south of Buenos Aires, where the La Plata (Eva Perón) line leaves the main line to the south. The level crossing near Sarandí Station with the Avenida Eva Perón, the main road to the south, had become an almost intolerable bottleneck

because of the busy road and rail traffic. As parallel streets also were crossed on the level by the railway, the road traffic could not be diverted and a costly railway viaduct was the only solution.

The viaduct is built entirely of reinforced concrete at a height varying from three to seven metres from the ground. The largest span is one of 44 m. over the Avenida Eva Perón. Some 15,000 tons of cement were used. The total cost of the viaduct was 34,000,000 pesos, to which must be added another 4,000,000 pesos for the construction of the 150,000 cu. m. embankments at each end, and 80,000,000 pesos for the expropriation of land.

The new Sarandí Station and signalbox are situated about the centre of the viaduct. Twenty level crossings are abolished and the formation of the original railway will be used for a wide avenue.

The viaduct, which is claimed to be the longest of its type on the American continent, was designed by Argentine engineers and built of Argentine material with Argentine labour.

Demolition of Central Argentine Headquarters

The Central Argentine Railway building at Bartolomé Mitre 299, Buenos Aires, long the headquarters of that railway, is to be demolished to make room for an extension to the neighbouring Industrial Bank of the Nation. The offices have already been transferred to the new building at Presidente Perón Station, which was originally intended for the Administrative offices but was used instead as the headquarters of the Ministry of Transport.

FRANCE

Rail-Road Co-ordination

Articles 29 to 31 of the rail-road co-ordination decree of November 14, 1949, set out the measures to be put into force by the Government regarding the conveyance of goods by road. It envisaged the establishment of a long-distance zone covering the whole of metropolitan France and a number of short-distance zones, one for each *département*. Details were given of the way in which the issue of licences would be controlled and the qualifications which would entitle road transport undertakings to apply for registration in the zones. It was, however, laid down that these articles would only be effective from a date to be fixed by ministerial decree.

Despite considerable agitation, such a decree was not issued until June 3 last. It stated that the arrangements set out in articles 29 to 31 of the 1949 decree would, as far as the short-distance zones are concerned, operate from July 1 and, in respect of the long-distance zone, from January 1, 1954.

New Bridge at Macon

Monsieur Maurice Lemaire, former Director General of the S.N.C.F., speaking at Macon, said that completion of the new railway bridge over the River Saône there would enable electric trains running to Switzerland and Italy to cross at a speed at 85 m.p.h. The shortening of the route thus effected would save many thousands of pounds a year. He also intimated that a credit of fr. 50,000,000 (£50,000) has been made available to begin the reconstruction of Macon Station.

The Macon to Bourg section is to be doubled. The Macon-Ambérieu and Lyons-Culoz sections will be improved to enable electric locomotives with axle-loads of 23 *tonnes* to be run. The Macon Bridge, now under reconstruction, has a span of 200 m. The permanent way will comprise a metal platform for each track covered with reinforced concrete. There will be six piers in the Saône, of which two are completed and the other four in course of reconstruction. On the Macon side the abutment is 85 per cent completed and on the Ambérieu side 60 per cent.

Luggage Racks

Uniform dimensions have been laid down by the S.N.C.F. for luggage racks in new coaches. The depth of the racks in some of the older vehicles was as little as 310 mm. (12·2 in.); the standard depth in all new coaches, for both first and second class accommodation, will be 390 mm. (15·35 in.). This is identical with the standards adopted by the Italian and Luxembourg railways. In other countries, the depth varies from a minimum of 360 mm. (14·2 in.) in Hungary, for coaches used in international traffic, to a maximum of 435 mm. (17·1 in.) for coaches of similar type in Germany.

The height of the front of the rack above floor level is normally about 1·80 m. (5 ft. 11 in.) in both S.N.C.F. vehicles and elsewhere on the Continent.

A further controlling factor is the distance of the front of the rack behind the edge of the seat. On the S.N.C.F. this dimension is 370 mm. (14·56 in.) for first and second class seats and 200 mm. (7·87 in.) for third class accommodation. In third class coaches of certain other continental railways it is sometimes as low as 120 mm. (4·72 in.).

PORTUGAL

New Rolling Stock

In August delivery is expected of the first of 35 diesel railcars and 20 trailers being built by Allan N. V., of Rotterdam. The order covers 25 railcars, seating 74, and 12 trailers, seating 106, for the broad gauge, and ten railcars and eight trailers for the narrow gauge; the narrow-gauge vehicles seat 44 and 68 respectively.

Seven Budd-type stainless steel coaches, with first- and second-class accommodation, are being supplied by Carel Fouché et Cie.

DENMARK

Copenhagen Electric Extension

On June 17 the Copenhagen suburban electrification was extended from Valby to Glostrup. The line from Copenhagen to the west formerly had only two tracks carrying both main line passenger and goods traffic and rapidly-growing local traffic. It was decided to lay two more tracks from Valby to Hvidovre and one more track thence to Glostrup and electrify the new lines.

Although the new line is only about 4½ miles long it has entailed important works. Twenty bridges have been built or rebuilt. The layout at Vigerslev signalbox has been complicated by the increase in the number of tracks from two to six. At Valby, where Ballerup trains turn off, the down electric trains for two directions use the same track, while the up trains from each direction have separate tracks, which enclose an island platform and unite beyond.

The stations between Valby and Glostrup are Hvidovre and Brøndbyøster. A station will later be built at Rødovre to cater for housing development. The intermediate stations have raised island platforms. Concrete flags of different colours have been laid along the platform edges to make it easier for passengers alighting to see whether the train has stopped.

WESTERN GERMANY

Nuremberg Transport Museum Reopened

The Transport Museum at Nuremberg, the most comprehensive of its type before the war, has been reopened. Since the war it had accommodated Federal Railways and postal offices, because of lack of accommodation elsewhere. Prewar exhibits included six-wheels saloons of the royal train built for King Ludwig II of Bavaria (1864-86).

New Passenger Connection to Zurich

In the summer timetable effective from May 17 the Federal Railways have introduced the "Helvetia Express" between Frankfurt Main and Zurich; the journey time in both directions is 5 hr. 26 min.

Catering in this pair of trains is performed in both Germany and Switzerland by the German Sleeping & Dining Car Company; this is stated to be the first time since the war that this German company has operated in Switzerland. The prewar Mitropa Company operated a number of sleeping and restaurant car services between Germany on the one hand and Switzerland and other countries contiguous to Germany.

EASTERN GERMANY

Fare Concessions Modified

Revision of passenger fares as from April 1 has involved abolition of concessions such as those to disabled, blind, deaf, and dumb persons, sick children travelling to and from convalescent homes, and so on. Workmen's fares have been doubled. On the other hand, a number of concessions still are in force, such as to children and young people journeying to youth festivals and winter sport centres, and to persons travelling to recreational homes maintained by political parties.

Locomotive Boiler Performance

Efficiency tests carried out at Swindon testing plant for British Railways class "4" 4-6-0 standard engine

By E. C. Poultney, O.B.E., M.I.Loco.E.

AT the end of last year the Railway Executive issued Bulletin No. 4 giving particulars of a series of performance and efficiency tests carried out with a class "4" 4-6-0 type locomotive, designed for mixed-traffic working and having, by reason of its relatively light axle loadings and limited overall dimensions, a considerable route availability.

This particular 4-6-0 class "4" engine is especially notable because it is one of the 12 standard types projected for service on British Railways, a fact which adds interest to the test results. Further, the report states that this locomotive is of the same family of design as the engine described in Bulletin No. 3. The test results are, therefore, it is said, directly comparable. The previously issued Bulletin No. 3 also referred to a class "4" locomotive but of the 2-6-0 type, designed by the former L.M.S.R., but which will, with certain detail modifications, form one of the British Railways standard engines. The result of this and other earlier tests were given in a series of articles, the first of which appeared in our October 10, 1952, issue.

The object of the present article is to offer some remarks on the test report data given by Bulletin No. 4 and refer to the relative performance of the boilers as used for the 2-6-0 and 4-6-0 type engines; and to discuss the performance of the 4-6-0 class "4" boiler, making some reference to certain additional test data presented in the bulletin; the leading particulars of the boilers are given in Table 1.

TABLE 1

Locomotive type and class	4-6-0 class "4"	2-6-0 class "4"
Boiler type	Belpaire	Belpaire
Working steam pressure, lb. per sq. in.	225	225
Heating surfaces, sq. ft.		
Tubes and flues	1,301	1,090
Firebox	143	131
Total evaporative	1,444	1,221
Superheater	265	231
Combined	1,709	1,452
Grate area, sq. ft.	26·7	23
Ratios		
Firebox heat : surface/grate area	5·35	5·67
Firebox heat: surface/evap. heat surface	10·6 per cent	10·7 per cent
Evap. heat : surface/grate area	54	53·3
Superheater heat: surface/comb. heat. surface	15·59 per cent	15·90 per cent
Comb. heat: surface/grate area	64	63·2

Former Bulletins Compared

Bulletin No. 4, though following in general the pattern set by those previously issued, provides certain additional information referring particularly to the boiler performance. This comprises graphs showing the gas produced and air supplied in relation to the coal actually "burned" and also in relation to the steam produced and exhausted. On the latter basis, blastpipe steam pressures and the resulting draught readings are also given as measured in the ashpan, firebox, at the smokebox tube plate, and at the self-cleaning plates. An additional plot of considerable importance shows the dry coal "burned" in lb. per hr. in relation to the amounts "fired," also measured in lb. per hr. This information should make it possible to determine the proportion per cent of the coal "fired," that is, actually "burned."

The importance of this graph lies in the fact that boiler efficiencies at all rates of firing depend on furnace efficiencies as shown by the proportion per cent of the coal "fired" that is actually "burned." The remaining new plots showing how gas production and air supply are related to the coal "fully burned" and to the steam generated and exhausted are also informative, though it is perhaps rather unfortunate that they have been reproduced to a somewhat small scale.

Comparison of 2-6-0 and 4-6-0 Boilers

The similarity in the performance of the boiler for these two locomotives is very striking, as will be seen from the particulars given in Table 2. The data given cover operation with Blidworth and Bedwas fuels, and it will be noted that the maximum rates of firing when using the same quality of coal are for all practical purposes the same for each boiler.

TABLE 2

Locomotive type and class	4—6—0 Class "4"	2—6—0 Class "4"	4—6—0 Class "4"	2—6—0 Class "4"
Coal fired	Blidworth	Blidworth	Bedwas	Bedwas
Coal fired lb. per hr.	3,250	2,840	2,535	2,510
,, ,, per sq. ft. of grate area per hr.	122	123	106	109
Water evaporated, lb. per hr.	19,600	17,000	19,600	17,000
,, ,, per sq. ft. of evap. heating surface per hr.	13·55	13·90	13·55	13·90
Water evap., lb. per lb. of coal fired	6·04	5·99	6·95	6·78
Equivalent evap. water, lb. per hr.	26,600	23,200	26,780	23,200
,, ,, per lb. of coal fired	8·2	8·2	9·45	9·21
Boiler efficiency, per cent	62	63	65·5	64·5

The maximum evaporations reached in each case are the same in relation to the evaporative heating surfaces, and the water/coal ratios are very closely alike when based on the actual and equivalent evaporations. Finally, the relative boiler efficiencies are seen to be practically equal. It is clearly evident from the above that, as the bulletin states, these two locomotives are of the "same family of design."

Class "4" 4-6-0 Boiler Performance

The trials made with the 4-6-0 class "4" standard locomotive were carried out on the testing plant at Swindon and on the road, the test procedure being the same as for the Western Region "Hall," E. & N.E.R. "B1," and L.M.R. class "4" 2-6-0 engines, as described in Bulletins 1, 2 and 3. For the tests with the standard class "4" engine, two different qualities of coal were used, of which the following are brief particulars:—

	As received	Dry
Blidworth—		
Calorific value (gross), B.Th.U. per lb.	12,930	13,890
Proximate analysis—		
Volatile matter per cent less moisture	32·7	35·2
Fixed carbon, per cent	56	61·1
Ash, per cent	4·4	4·7
Total sulphur, per cent	0·65	0·70
Moisture	6·9	—
Bedwas—		
Calorific value (gross), B.Th.U. per lb.	13,970	14,220
Proximate analysis—		
Volatile matter per cent less moisture	24·6	24·9
Fixed carbon, per cent	65·6	66·9
Ash, per cent	8	8·2
Total sulphur, per cent	0·95	0·96
Moisture, per cent	1·8	—

Evaporative Performance

The evaporative performance of the boiler is given by the plot, Fig. 1, in which the relative total evaporations and the water/coal ratios are shown plotted against firing rates coal lb. per hr. For a maximum evaporation of 19,600 lb. of water per hr., the relative quantities of coal fired per hr. are Blidworth 3,250 lb. and Bedwas 2,835 lb., corresponding to firing rate of 122 and 106 lb. per sq. ft. of grate area per hr. and water/coal ratios of 6·04 and 6·95 respectively.

The overall boiler efficiencies are 65·5 and 62 per cent at these rates of firing. The plot, Fig. 2, shows the relative evaporations in a different manner; in this case the quantity of coal fired lb. per hr. is plotted against rates of evaporations water lb. per hr. The rapid increase in the quantity of coal fired in relation to the water evaporated as the rate of working advances is clearly apparent.

It will be noted that, when Bedwas coal is used, the increase in coal consumption in relation to the water evaporated is not quite so rapid as with Blidworth coal. There is a higher rate of evaporation per lb. of coal fired due to the higher calorific value of this coal. The efficiency of the boiler is, however, about equal to that shown when Blidworth coal is used. Keeping in mind the fact that boiler efficiency is very

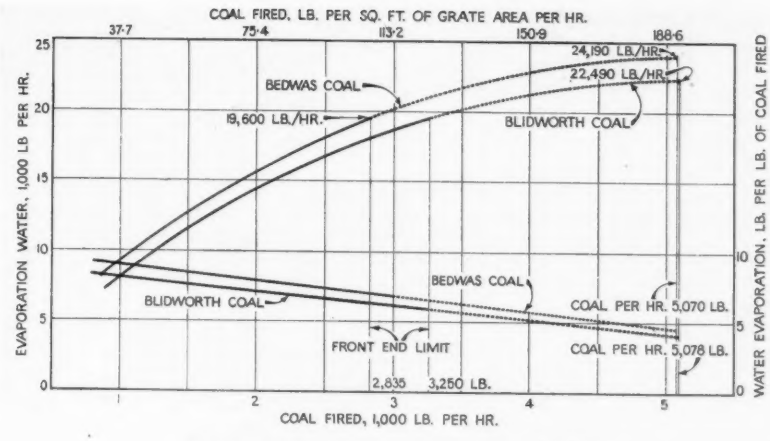


Fig. 1—Evaporative performance of boilers

largely governed by the efficiency of combustion, the relative overall efficiencies shown in Fig. 3 are noteworthy.

Bedwas coal is stated to be of a friable nature in common with other Welsh coals and, in view of the effect of fine coal on boiler efficiency, each increment of coal as bagged and weighed contained 8 per cent of fine coal, which is stated to be generally less than the proportion of fines in the coal actually "fired," as the coal was subject to further breakdown by the fireman after the increment had been placed at his disposal. The fact that at all rates of firing the boiler efficiency attained with Bedwas coal was closely equal to that shown when Blidworth coal was used is, in view of the above remarks, very interesting. It would appear to show that there was in fact very little loss due to fine coal escaping unburned. Both the Blidworth and Bedwas fuels gave almost equal boiler efficiency at equal rates of firing.

Evaporation Capacity

The maximum rate of evaporation reached with this boiler is 19,600 lb. of water per hr. attained at firing rates of 3,250 and 2,835 lb. of coal per hr. when using Blidworth and Bedwas fuels respectively. Remarking on this, the bulletin states that: "This rate of evaporation was the highest at which a balance could be continuously maintained between steam production and demand." The quantity of coal that can be burned and, hence, the steam produced will depend upon the air supply and, as already mentioned, this information is included in the bulletin.

Considering in the first place the conditions when Blidworth coal is fired, the coal fired is 3,250 lb. per hr. and a total of 28,000 lb. of air per hr. is taken through the firebox, equal to 8·6 lb. of air for each lb. of coal fired. At this rate of firing, about 2,370 lb. of coal are actually fully "burned." The proportion of coal "burned" to coal "fired" is, therefore, 73 per cent. The air supplied to burn each lb. of coal is just about 11·8 lb. The air drawn into the firebox per lb. of steam produced and exhausted is 1·4 lb.

Taking the conditions ruling when Bedwas coal is used, the coal fired per hr. is 2,835 lb. and the total air taken into the firebox per hr. 25,000 lb., equal to 8·8 lb. of air for each lb. of coal "fired." At this rate of firing, about 2,200 lb. of coal are actually fully "burned." The proportion of coal "burned" to coal "fired" is, therefore, 77·7 per cent. The air supplied to burn each lb. of coal is about 11·35 lb. The air drawn into the firebox per lb. of steam produced and exhausted is in this case 1·28 lb.

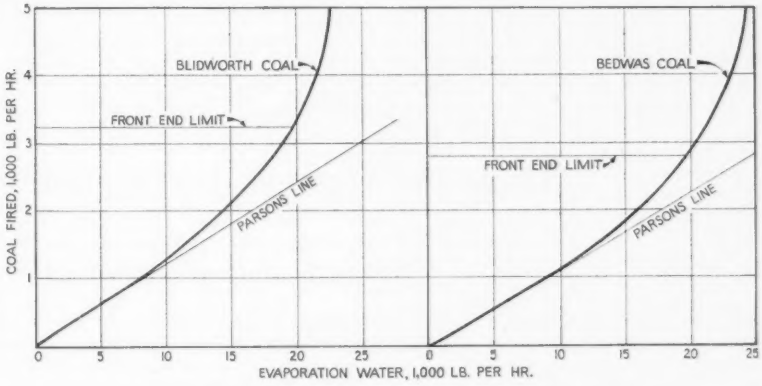


Fig. 2—Coal burnt in relation to evaporation per hr.

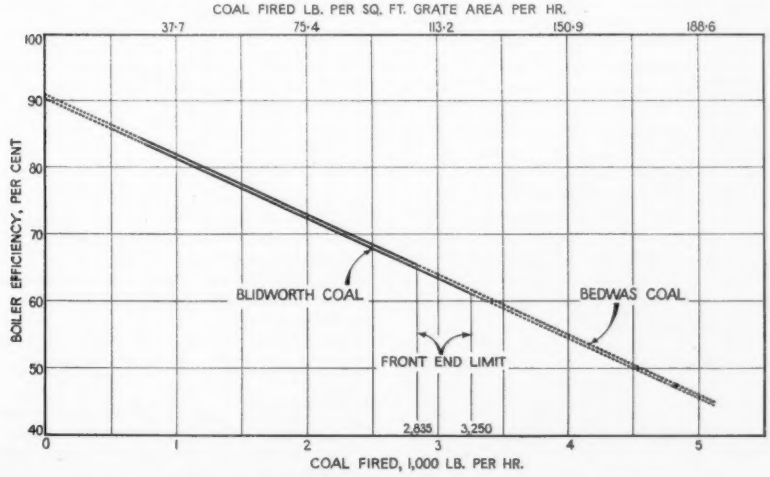


Fig. 3—Relative overall efficiency per cent

When considering the proportion of the coal "burned" in relation to the coal "fired," the different rates of firing must be remembered. When Blidworth coal was used, the firing rate was 122 lb. per sq. ft. of grate area per hr., the coal "burned" being 73 per cent of that "fired," while, when Bedwas coal was used, the firing rate was 106 lb. of coal per sq. ft. of grate area per hr. and 77 per cent of the coal "fired" was actually "burned."

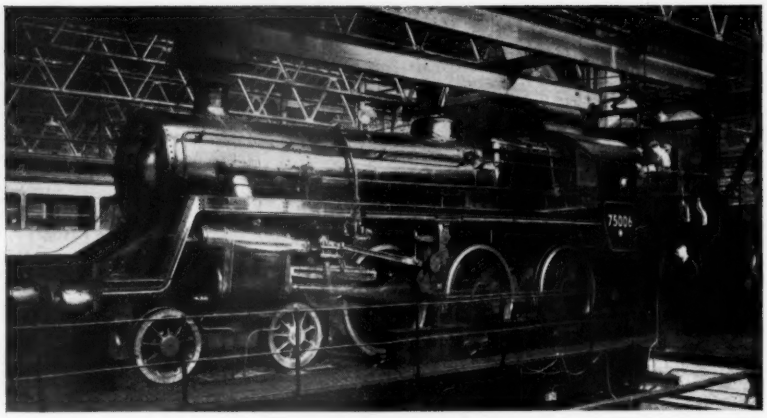
If the normal rate of firing is assumed to be 2,000 lb. per hr. or 75 lb. of coal per sq. ft. of grate area per hr., the relative proportions per cent of coal "burned" to that "fired" seem to be 85 per cent for Blidworth, and 88 per cent for Bedwas, the overall boiler efficiencies being about 72·5 and 73 per cent. The relative proportions of the coal "burned" as a percentage of the coal "fired" stand in almost the same relation as the two boiler efficiencies

per cent, thus indicating the close relationship between combustion efficiency and the overall boiler efficiency per cent.

The maximum rate of evaporation, as already stated, is seen to be 19,600 lb. of water per hr. when closely equal amounts of air are supplied for combustion for each lb. of steam produced and exhausted. This is said to be the limit set by the "front end." On the other hand, the potential maximum evaporation attainable is 22,490 lb. of water per hr. when Blidworth coal is used, while for Bedwas coal an evaporation of 24,190 lb. of water per hr. is possible.

Drawbar Horsepower

On the basis of Blidworth coal, the boiler may be worked to about 88 per cent of its potential capacity and, if Bedwas coal is used, this figure becomes about 82 per cent. Expressed in terms of horse-powers developed at drawbar and when using Blidworth coal, the power developed is 1,100 d.b.h.p. at 45 m.p.h. when the evaporation is 19,600 lb. per hr. while, if this is raised to 22,490 lb. per hr., 1,250 d.b.h.p. would be obtained, representing a drawbar pull of 1,040 lb. as against about 920 lb.



Class "4" 4-6-0 standard locomotive No. 75006 on the Swindon testing plant

Under the same conditions as regards speed, the increase in power for Bedwas coal would be from 1,100 to 1,320 d.b.h.p., corresponding to pulls of from 920 to 1,120 lb. To pass this additional amount of steam through the cylinders at the assumed constant speed of 45 m.p.h. would naturally require longer rates of admission and, in consequence, there would be some loss in efficiency. On the other hand, if it is assumed that the possible steaming capacity of the boiler should be available as may be required, a useful experiment might be made by increasing the diameter of the cylinders and modifying the exhaust nozzle and chimney to obtain an increase in the rate of air flow to support a higher rate of combustion, thus enabling the potential maximum capacity of the locomotive to be attained.

Dimming System for Signalbox Lighting

Wide range of transductor control for fluorescent tubes in Euston installation

IN the new power-operated signalbox at Euston, described in our December 19, 1952, issue, the lighting of the operating room, which was designed and installed by the London Midland Region in conjunction with the General Electric Co. Ltd., incorporates means of dimming the fluorescent tubes in order to help good night visibility and also to make the installation more flexible to suit varying conditions. The system is of the transductor type, in which the transductor behaves effectively as a variable impedance choke.

The transductor comprises a three-limb laminated core with two a.c. windings, series-connected, on the outer limbs of the core, together with a large d.c. coil wound on the centre limb. Tube current is controlled by varying the current through the d.c. coil, which in turn varies the saturation of the core. A dimming range of 55 to 1 is achieved by this means.

The complete equipment for each tube consists of a filament-heating transformer, choke, and transductor. The filament-heating transformer in conjunction with the instant-start tube ensures immediate initiation of the discharge irrespective of the position of the dimmer.

Excessive temperatures at the cathodes in the full-up position are avoided by the compensating effect obtained with the choke connected in series with the primary of the transformer. The dimming equipment for the tubes is housed in a cupboard in the equipment room at the south end of the box and a small switch panel is fixed at one end of the operating room for the control of the ten fittings. One switch brings in the main contactor, and a variable transformer controls the a.c. input to the full-wave rectifier for the d.c. supply. Each of the ten fittings is individually switched.

Conditions Governing Installation

The conditions for which this installation was planned were such that the low-brightness fluorescent tube was decided to be the most suitable light source. Ten fittings with specially designed louvres, each housing one 5 ft. 80 W. tube, are mounted directly on the ceiling in a continuous line down the centre of the room. The louvre provides a light distribution which ensures adequate illumination of the lever frame and instruments with remarkable freedom from shadow.

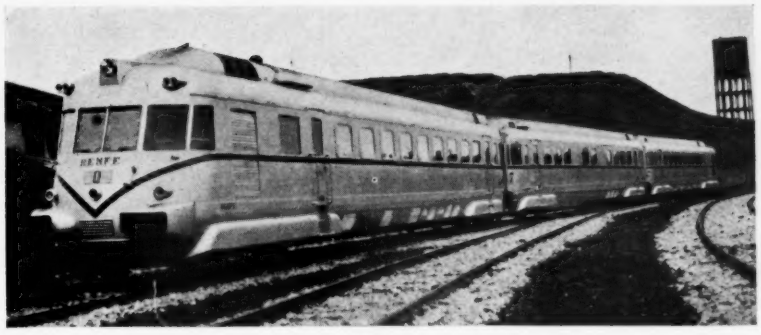
Another function of the louvres is to cut off direct light to the illuminated diagrams, which are 5 ft. 6 in. from the floor and are mounted at a slight angle to the vertical so that no reflected images of the lighting fittings are seen by signalmen standing at the lever frame. The louvres also have the effect of preventing glare in the eyes of the regulator, who sits facing the line of fittings, and they eliminate window reflection by preventing direct light falling on the windows.

PESCARA FREE-PISTON GAS GENERATORS: FIRST BRITISH SUB-LICENSEE.—Alan Muntz & Co. Ltd., of Heston Airport, Hounslow, Middlesex, United Kingdom and British Commonwealth exclusive licensee for the Pescara free-piston engine system, announces that Charles D. Holmes & Co. Ltd., of Hull, makers of steam reciprocating engines for trawlers and other small vessels, has recently signed a sub-licence agreement. Charles D. Holmes & Co. Ltd. become the first British firm to take a manufacturing sub-licence for this type of prime mover.

B.S. FOR DOMED ENDS FOR TANKS AND PRESSURE VESSELS.—A British Standard (B.S. 1966: 1953) has been prepared to meet the need to rationalise the large numbers of shapes and sizes of ends for tanks and pressure vessels now being used; an attempt has been made to standardise the sizes and shapes of ends most commonly used. This standard has been based largely on mild steel ends, but many of the forms and proportions specified apply to ends made from other materials. A range of ends from 36 in. to 108 in. nominal diameters is given. Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 24 Victoria Street, London, S.W.1. Price 2s. 6d.

Modernisation of the Spanish National Railways

Large-scale programme for new locomotives and rolling stock; extension of electrification and important way and works projects



Fiat three-car diesel set used on services between Madrid and the North Coast

IN 1948 the Spanish National Railways drew up a comprehensive plan of reconstruction, complementary to a five-year plan for carrying out essential works, authorised in 1946. Some details of the 1948 scheme were given in our July 6, 1951, issue. Subsequently, increases in prices made it necessary to increase the estimates and alter in the same proportion the maximum amounts authorised to be issued annually. At the same time it was considered advisable to incorporate other improvements, such as a programme for metal-panelling wooden coaches. The total cost is now 12,661 million pesetas.

Public authorities in Vizcaya and Santander asked that the National Railways should electrify as quickly as possible the lines serving those provinces and offered to raise the necessary capital, provided that electrification was included in the revised plan. Also it had been found opportune to use, for financing improvements, some of the funds accruing from the loan of $70,000,000 made by the U.S.A. for railway development in Spain. It was intended to apply part of this sum to electrification where suitable, apportioning a separate amount in the estimates of the plan for the electrification of the abovementioned new sections.

It was also necessary to make provision for the extension of diesel traction after the two-year period of the trials of the Talgo trains on the Madrid-Irun line had elapsed. Another addition was a number of electric locomotives for suburban passenger service.

The augmented plan covers the purchase of steam locomotives not supplied under the contract placed in 1941 for a total of 150, with the addition of 100 new locomotives ordered in 1945, later increased by 22, and 25 2-8-2s ordered from the North British Locomotive Co. Ltd. and another 125 to be built in Spain from parts supplied by that company. The number authorised now stands at 534, delivered or still awaited. Twenty Sulzer-type diesel-electric shunters, with Crompton Parkinson electric transmission equipment, are being supplied under the plan.

Fifty diesel railcars are included. Delivery began in the Spring of 1952 of 20 sets built by Fiat; each comprises two motor coaches and a trailer. The first five sets went into service between Madrid and Santander, and Madrid and Gijon and places in Galicia. The amount of 380,000,000 pesetas has been scheduled for the purchase of lightweight articulated trains, to be diesel hauled, and it is intended that these shall be 15 Talgo-type trains, in view of the success of the trial running of two trains formed of this equipment between Madrid and Hendaye.

Coaches and Wagons

The completion of deliveries of 120 coaches ordered in 1943 and 200 ordered in 1944, and the purchase of 200 new coaches (100 to be built in France and 100 in Spain of French materials) forms part of the rolling stock programme. At the end of last year only 132 coaches had still to be delivered of the Spanish-built "5,000" series; all the French-built "6,000" series had been received. The plan includes also a new item, recently authorised, the metal panelling of 190 coaches and vans at a cost of 126,800,000 pesetas.

Spanish firms are building the 166 vans scheduled. When the plan was first drawn up it was agreed to complete supplies on order to a total of 5,055 wagons, and place fresh contracts for 5,000 open and 50 bogie, closed wagons and 740 of what are described as "American wagons"; the last mentioned were put into service in 1949. Orders for 1,300 wagons and for materials for building 2,600 more in Spain were placed in Belgium. One thousand "X" type wagons, ordered last year, have already been supplied. New contracts are being placed with Spanish firms. The reconstruction of 45,000 wagons and vans, also scheduled in the plan, may be said to be completed.

Axles on 28,000 wagons are being replaced by those of larger section and fitted with modern-type axleboxes. The buffing and drawgear of 54,000 wagons is being strengthened; new gear to stand a strain of 70,000 kg. is being fitted. All the 10,000 drawgear sets ordered from Head, Wrightson & Co. Ltd. and some of 13,000 ordered in France have been received, and a contract is pending for the supply of 1,000 more. The automatic braking of 1,000 wagons on the S.A.B. System, a Swedish patent, is being carried out, and it is likely that 17,000 will eventually be so equipped. A dynamometer car has been delivered, and six mobile cranes are being built.

Electrification

Originally, electrification of lines totalling some 690 miles was contemplated. To them are added those lines which it has been decided since to electrify as a result of the acceptance of financial participation by the local and provincial authorities of Vizcaya and Santander. Also included are the lines, which, extending the section

One of the diesel-hauled Talgo high-speed lightweight trains as used between Madrid and Irun

already projected from Santa Cruz de Mudela to Baeza, complete electrification between Manzanares and Cordoba. With these modifications the lines to be electrified are:—

	Km.	Miles
Leon-Ponferrada, Leon-Busdongo ...	182	112
Ujo-Gijon and Asturias branches ...	114	71
Mora-Reus, San Vicente-Villanueva, Barcelona-Mataro-Empalme, Reus-Tarragona-San Vicente	390	243
San Vicente-Villafranca-Barcelona-Granollers Empalme and Granollers-Las Franquesas	190	118
Manzanares-Baeza-Cordoba	242	150
Bobadilla-Malaga Puerto	72	45
Alar-Santander	139	86
Miranda-Bilbao	145	90
Miranda-Alsasua	76	47
Total	1,550	962

The overhead equipment has been ordered for 850 miles of line and erection has begun at some places. Four firms have received contracts for approximately equal lengths of line.

The motive power so far ordered includes 100 electric locomotives, 20 from Alsthom, 60 from the English Electric Co. Ltd., and 20 from the Westinghouse Electric Corporation. Of these, the first have arrived in the last few months from Britain and France. Sixty more units have been ordered in Spain, for construction to plans by Alsthom.

Twenty-four equipments for substations have been ordered from abroad, twelve from Ateliers Electriques, Charleroi, five from Alsthom and seven from Westinghouse—and 15 of Alsthom type will be manufactured in Spain.

Communications

Carrier current telephony is to be installed over a distance of 1,250 miles which includes the existing three-channel system between Madrid and Cordoba, shortly to be extended to Seville. Contracts have been placed for 35 V.H.F. radio transmitting and receiving stations to form a W/T and R/T network. Telephone circuits with selective calling are being provided over a distance of some 1,740 miles, of which about 435 miles are now working. Loudspeaker installations at stations are being extended, 25 new ones having been brought into service at important centres. A private dial telephone system at Saragossa links the three stations serving the city.

The general plan includes carrying out the first stage of a scheme for the complete overhauling and improvement of the existing signalling. It covers the installation on all lines of the new unified signal code.

Installation of new electrically illuminated signals, adapted to the new signal code, is proposed on 2,150 miles of line and at 475 stations; in four new sections, with a total length of 160 miles, and at 42 stations, are to be installed block automatic and electro-block systems between stations. In other sections in which the block-automatic already exists, the new code will be established. On the single-track Ponferrada-Branuelas section, some 19 miles long, with nine stations, where there is heavy traffic, C.T.C. is about to be installed.

Elsewhere, existing oil-lit signal lamps are being changed to electric; this affects 2,500 miles of line and 500 stations, and most of the work is well in hand.

Way and Works

Completion is provided for of certain defence works, retaining walls, and other works which already have been partly carried out, and the replacement or strengthening of bridge spans; this latter class of work is of great importance, to remove the limitations on the types of locomotives which can operate on some lines. The plan now covers replacement or reinforcement of metal bridges in Asturias and on the so-called "Catalan Eight" section, and between Palencia and Palanquinos, and Alar and Santander. The total number of bridges scheduled is more than ninety and the initial cost more than 200,000,000 pesetas. Many of these works have now been completed, but those still outstanding include the bridge over the Duero on the Soria line, that at Vinalopo on the Alicante line, that over the Ebro at Saragossa and that at Marcilla on the Saragossa-Alsasua line. On some lines which

One of the 60 Co-Co 3,600 h.p., 3,000 v. d.c. electric locomotives being built for the Spanish National Railways by the English Electric Co. Ltd. and the Vulcan Foundry Limited. The first of these are operating on the Ujo—Busdongo section of the system

have only limited traffic, bridge strengthening has been completed.

A total of 4,320 miles of line has been scheduled for complete or partial renewal. So far 430 miles have been completed, including the Miranda-Alsasua section of the Madrid-Irun main line, on which 18-m. rails manufactured in Belgium have been laid. Progress has been helped by the import of rails under the U.S.A. $7,500,000 loan, which will enable the work to be accelerated, a necessary preliminary to electrification. On lines where renewal has been completed the benefit is already apparent in the removal of speed and weight restrictions,

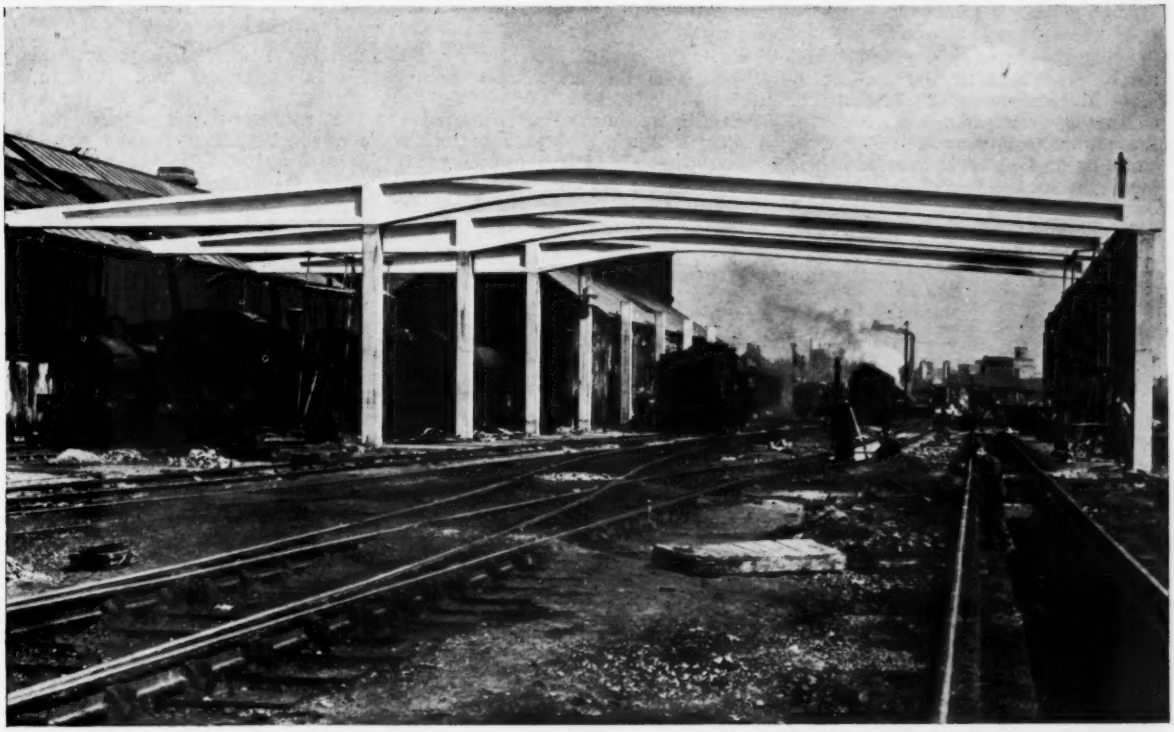
Important station works, of the total of 350 laid down in the programme, have been carried out at Bilbao, Monforte, Valencia de Alcantara, and elsewhere. A new station has been built at Alcazar de San Juan. Reconditioning and extension of offices, works, depots and stores throughout the system form a large part of the programme, which also includes the purchase of machine tools and other new equipment. Workshops will be improved and more machinery installed at principal depots. It is proposed to install more mechanical coal loaders.

Ten new repair shops (including Granada, Malaga, Valencia-Alameda, Tarragona-Clasificacion, Barceloneta, and Madrid-Principe Pio) are to be set up, and complete repair works for diesel engines at Valladolid, Madrid, and Seville and railcar depots at other places will be built. A plant is to be built at Villaverde Bajo to serve as the general works of the electrical department and to manufacture and repair electrical material including traction equipment.

Much of this work and work of less importance has begun and some is well forward. Considerable progress has been made with the extension of the depot at Madrid-Principe Pio, the new traction works at Barcelona-San Andres, the foundry at Malaga, and the railcar works at Cerro Negro, Madrid. The extensions to the Talgo works at Aravaca, and the new creosoting works at Castejon and Santas Martas are complete.

Large numbers of 2-8-2 *steam locomotives similar to the above are being placed in service on the Spanish National Railways*

Reconstruction of Ipswich Motive Power Depot, Eastern Region



Prestressed concrete beams of a special type manufactured for the reconstruction of the motive power depot at Ipswich. The tapered portion of the beam (on left) is designed as a cantilever, as no suitable supports were available on an existing wall, which had to remain

Realigning a Texan Main Line

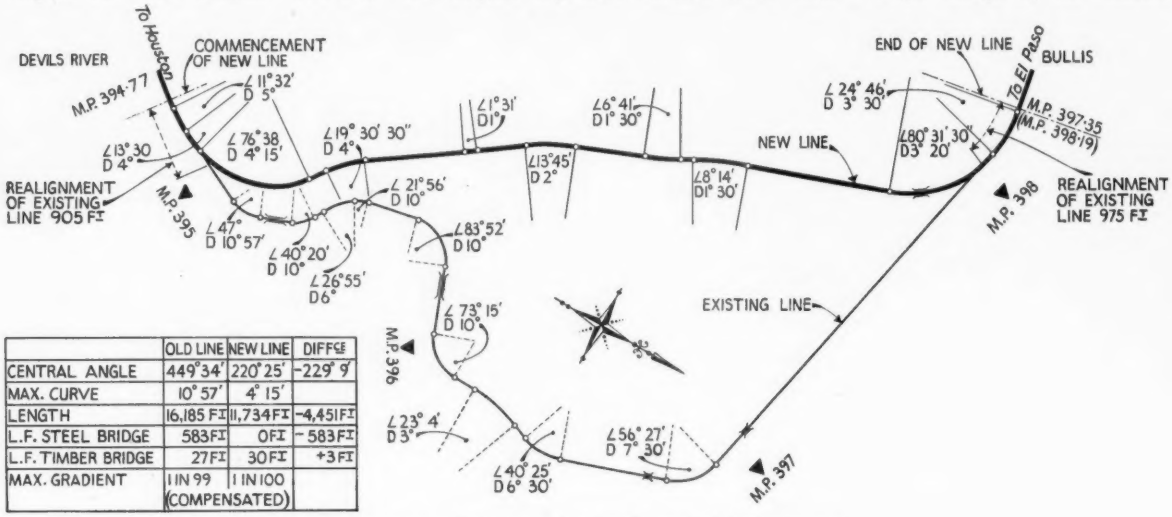
Easing curves and reducing distance on the Los Angeles-New Orleans route

THE Texas & New Orleans Railroad, a system in Texas and Louisiana controlled by the Southern Pacific, has undertaken a short but remarkably beneficial realignment west of Devil's River in western Texas, on the El Paso and San Antonio section which forms part of the Sunset route between Los Angeles and New Orleans. The new line, like the old, is in very broken and almost precipitous terrain, and mostly involved continuous alternations of cuttings and embankments. Some of the cuttings are as deep as 71 ft. and the banks up to 48 ft. high; excavation was mostly in rock. Nevertheless modern constructional methods kept the cost down to only £160,000, £62,000 a mile, an expenditure amply justified by the advantages conferred by the new line.

The length by the old route was 16,185 ft., but by the new chord line only 11,734 ft. The old line was most tortuous, and its aggregate curvature at the centre was 449 deg., more than twice that on the realignment, 220 deg. The original alignment included some 9-ch. curves and one 8-ch. curve, but 20½-ch. radius is the sharpest on the new line.

Even more outstanding is the reduction in bridging, a single short bridge (two spans of 15 ft.) replacing five bridges on the old alignment, aggregating 610 ft. in length, and including three steel structures. The ruling gradient has been eased from 1 in 90 to 1 in 100.

With so much rock excavation from extremely steep hillsides, it was necessary to lower men down the sides on ropes, to enable them to drill the many holes required for explosive charges. Up to 5,000 cu. yd. of rock were blasted with a single charge by the modern methods used. Altogether, about 271,000 tons of rock had to be removed in the course of the work. The earthwork was carried out by contract, but the permanent way work departmentally. The whole project was under the general supervision of Mr. L. A. Loggins, Chief Engineer, T. & N.O.RR.


To Houston
DEVILS RIVER
COMMENCEMENT OF NEW LINE
M.P. 394·77
∠ 11° 32' D 5°
∠ 13° 30 D 4°
∠ 76° 38' D 4° 15'
∠ 19° 30' 30" D 4°
∠ 1° 31' D1°
∠ 6° 41' D1° 30'
∠ 13° 45' D 2°
∠ 8° 14' D1° 30'
NEW LINE
END OF NEW LINE
BULLIS
To El Paso
∠ 24° 46' D 3° 30'
∠ 80° 31' 30" D3° 20'
M.P. 397·35 (M.P. 398·19)
REALIGNMENT OF EXISTING LINE 905 FT
M.P. 395
∠ 21° 56' D 10°
∠ 47° D 10° 57'
∠ 40° 20' D 10°
∠ 26° 55' D 6°
∠ 83° 52' D 10°
M.P. 398
REALIGNMENT OF EXISTING LINE 975 FT
EXISTING LINE
M.P. 396
∠ 73° 15' D 10°
∠ 23° 4' D 3°
∠ 56° 27' D 7° 30'
∠ 40° 25' D 6° 30'
M.P. 397

	OLD LINE	NEW LINE	DIFFce
CENTRAL ANGLE	449°34'	220°25'	-229° 9'
MAX. CURVE	10° 57'	4° 15'	
LENGTH	16,185 FT	11,734 FT	-4,451 FT
L.F. STEEL BRIDGE	583 FT	0 FT	- 583 FT
L.F. TIMBER BRIDGE	27 FT	30 FT	+3 FT
MAX. GRADIENT	1 IN 99	1 IN 100 (COMPENSATED)	

Curvature of the new (in bold) and old alignments

Cuttings up to 70 ft. deep occur on the new alignment

First freight train on the new line

The Ultrasonel Flaw Detector

Detecting discontinuity by measuring the intensity of ultrasonic waves

Ultrasonel equipment as used for flaw detection in welded tubes

ULTRASONIC waves lend themselves particularly to the non-destructive testing of materials. These waves are injected into the materials under test, and either pass through the specimen, or are regularly reflected off the reverse surface. Defects such as minute cracks, or porosity, cause some of the waves to be irregularly reflected, or dispersed throughout the material. The resulting fall in intensity is registered on a meter and aurally. Equipment for this purpose is marketed and maintained in this country by the Trevor-Johnstone Co. Ltd., and was produced originally by Ateliers de Constructions Electriques de Charleroi to overcome the problems of detecting laminations in locomotive frames and particularly thin plates generally.

The basic design of the Ultrasonel non-destructive material control equipment lies in the application of the ultrasonic energy used. Instead of depending on the pulsed echo technique, the equipment measures the intensity of the continuous wave which is projected through the test specimen. The pressure waves are generated by a piezo-electric quartz crystal which vibrates when subject to an alternating current of 1 Mc/s frequency. The ultrasonic transmission may be applied either as a pure sinusoidal wave, or may be modulated in amplitude or frequency.

The ultrasonic waves propagated by the material are received by a second quartz crystal which converts the pressure waves into electrical oscillations. These are conveyed to the receiver, which amplifies the signals and displays their intensity in meter form, and, if the transmission is modulated, aurally through a loudspeaker. Furthermore, the intensity of the received signals may be used to trip either the low transparency or peak indicator as may be required.

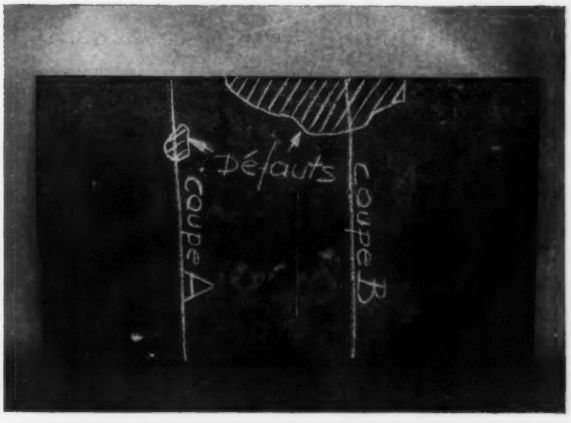
Solution of Contact Problem

The contact problem has been completely solved by the provision of patented turgescent feelers which ensure that the ultrasonic vibrations of the crystal are efficiently injected into the specimen with surfaces which are "as cast." The feelers are constructed to permit water to be pumped between the crystal and its covering rubber membrane. The flexible membrane conforms to the irregular surface of the specimen and thus no air is permitted to interfere with the flow of ultrasonic energy from the transmission crystal to the receive crystal.

All losses therefore arise from lack of continuity in the material under test. Various types of feelers are available for different circumstances, and include the standard type with or without the guiding ring, and the axial needle, transverse needle, flat, and sprinkling types. In cases where it is necessary to test a specimen for minute defects, needle feelers may be used. As there is only a small surface contact, the turgescent principle need not be applied, a small elastic protuberence being sufficient.

As far as possible the needle type feelers should be used for reception of the ultrasonic signals because the transmitting feeler should have an adequate

Applying the probes to a steel bar



Defects on a specimen steel plate

diameter to keep the divergence of the ultrasonic beam within reasonable limits. The sprinkler type feelers have their most useful application where the Ultrasonel is used in conjunction with the continuous testing of pipes and rails as they emerge from the final production stage of manufacture. This type of feeler consists of a crystal fitted into a cup into which water under pressure may be pumped while the feeler is pressed against the rail or pipe. The excess water is allowed to escape through the stiff rubber contact with which the rim of the cup is fitted and the surface of the specimen.

Operating Methods

Auxiliary apparatus, which varies with the manifold applications of the Ultrasonel, may be used to ensure that the transmitting and receiving feelers are maintained in a fixed position relative to the specimen under test. The type of apparatus would vary also according to whether transparency or echo technique is used.

Where the problem is that of testing a series of identical specimens of relatively simple geometric form, automatic acceptance/rejection control of a continuous production process may be effected by using the low transparency indicator. This indicator incorporates a relay circuit which closes when the intensity falls below a certain minimum reading which may be pre-set on the meter. The relay may be used to operate any desired electrical alarm or recording device to which it is connected.

Where it is necessary to carry out the manual testing of specimens of irregular shape the peak indicator is used. This indicator incorporates two electronic relays of infinitesimal inertia. Each of these relays trips and remains steady when the ultrasonic intensity received reaches a pre-set value. The peak indicator registers immediately through a set of signal lamps. A resetting switch returns the indicator to its original setting.

The Ultrasonel will detect either internal or surface defects. The internal defects may be revealed by either transparency or echo methods as may be convenient, whereas the surface flaws are detected by inclining the feelers at an angle to the surface. The feelers are set at an angle to the surface so that the ultrasonic waves move along the surface without penetrating the test material.

Irrespective of the method used, a flaw or defect causes some, if not all, of the ultrasonic beam to be intercepted and thus the intensity of the beam at the receiver is a percentage of the value obtained in a similar flawless part of the material. Because of this diagnosis is simple and skilled operators are not required to operate the equipment.

It will be appreciated that a number of small flaws will reduce the intensity in more or less the same degree as a single defect of larger dimensions. The Ultrasonel, which was originally designed for the detection of flaws in metal plates, has, it is claimed, proved highly successful for such purposes irrespective of the thinness of the plate. The size of the defect, as well as its contour, can be traced without ambiguity as is shown in the illustration on page 17.

New Arrival Indicator at Kings Cross

Times of next six trains shown simultaneously

THE roller blind type train arrival indicator at the south end of No. 1 platform at Kings Cross, Eastern Region, which gave details of the arrival of four trains at a time, has been replaced by a conveniently sited indicator which shows in column form particulars of the next six trains to arrive. The new indicator is built on the roof of the small office adjacent to the telephone kiosks at the extreme south end of No. 1 and is visible from the circulating area between Nos. 1 and 5 platforms.

The front of the indicator is 19 ft. 6 in. wide and 10 ft. high, and faced with buff linette Formica with light bronze angling. It can be externally illuminated as necessary by special fluorescent fitments.

Movable Panels

The six panels, giving details for trains, are guided by a top rail and run on rollers in a botttom channel moving across the face of the indicator as seen by the public from right to left. As each train arrives, the appropriate panel is removed on the left and the next five panels moved along, a new panel being brought into position on the right of the indicator.

All train information is given on enamelled plates, each panel being made up by the operator in the cabin of the indicator, located behind the face.

Any necessary alteration to a panel on display can be made from inside without removing the panel. The six panels are flanked by announcement panels; the intention is to use the one on the left for messages set up by means of interchangeable letters, whilst the right-hand panel will carry poster notices when required.

There is appropriate accommodation in the cabin for the operator with a storage cupboard for spare panels, and names and numeral plates. Access to the cabin is by a staircase at the rear.

The contractor is A. Edmonds & Co. Ltd., 78, St. John's Street, E.C.1.

Train information displayed on the new indicator

TROPHY FOR B.R. BRISTOL SAVINGS GROUP.—At a National Savings rally at Bristol on June 18 the Lord Mayor presented a trophy for the best effort by an industrial savings group to Mr. H. Bolton, District Commercial Superintendent, Western Region, who accepted the trophy for a 20·3 per cent increase in savings group membership.

HOFFMANN MANUFACTURING CO. LTD.; NEW BRANCH AT MIDDLESBROUGH.—To provide an improved service to customers in the Tees-side area, the Hoffmann Manufacturing Co. Ltd., of Chelmsford, on July 6 will open a new branch, where a stock of products will be maintained, at 176, Newport Road, Middlesbrough. (Telegrams: "Hoffmann Middlesbrough.")

RAILWAY NEWS SECTION

PERSONAL

Mr. Arthur Frank Kirby, C.M.G., M.Inst.T., who has been appointed General Manager of the East African Railways & Harbours, was born on July 13, 1899, and educated at Sir William Borlase's School, Marlow, and London University. He served with the London Rifle Brigade and the Second Rifle Brigade in Flanders from 1917-18, subsequently returning to the Great Western Railway. In 1923 Mr. Kirby was awarded a four years' course of special training in all departments, becoming attached to the General Manager's office for special duties in 1927. He sat for the first Institute of Transport Examination in 1926 and was one of the first to be appointed by examination qualification to Associate Membership of the Institute. In June, 1928, Mr. Kirby was appointed Assistant Secretary, Takoradi Harbour, Gold Coast, and served as Secretary to the Conference of General Managers of West African Railways, 1929. He became Traffic Manager, Gold Coast Railways in 1935, and was transferred to the post of Assistant Superintendent of the Line, Kenya & Uganda Railways, in 1938. In that capacity he was closely concerned with the movement of South African and West African troops brought to East Africa to wage the Abyssinian campaign against the Italians. Mr. Kirby was appointed General Manager, Palestine Railways, in April 1942. This post carried with it also the management of the Kantara-Rafa Railway in Egypt and the Director-Generalship of the Hejaz Railways in Trans-Jordan. He took over the Palestine section of the newly-opened Haifa-Beruit-Tripoli military railway in September, 1942, and also became Port Authority for all Palestine Ports in 1943. From 1944 onwards Mr. Kirby became Chairman of the Palestine Transport Advisory Council and Chairman of the Board of Scientific & Industrial Research in 1945-46. During his tenure of office in Palestine the capacity of the Palestine Railways was exploited to the utmost in the conveyance of vital wartime traffic, the capacity of the Kantare-Riga Railways was expanded from less than one train to twelve trains each way per day, and the Hejaz Railway in Trans-Jordan was improved to serve the new military post built at Akaba. Palestine was a base for Western Desert operations and Haifa port was largely used for the loading of invasion stores for Sicily and Italy. In 1946 Mr. Kirby established the Middle East Railways Conference Association comprising the Egyptian State Railways, Iraqi Railways, Chemin de Fer du Hejaz, Palestine Railways and Turkish State Railways. He was made Companion of the Order of St. Michael & St. George in the 1945 Birthday Honours. He remained in Palestine until the final evacuation of the British Mandatory Government in May, 1949, and handed over the port and railway installations to the local authorities. Mr. Kirby was appointed Superintendent of the Line, East African Railways & Harbours, in November, 1948. He became Chairman of a Committee to report upon development of the port of Dar-es-Salaam in March, 1949. Mr. Kirby was appointed Assistant Commissioner for Transport, East Africa High Commission, in January, 1951, subsequently becoming Acting Commissioner in August, 1952.

Mr. A. F. Kirby

Appointed General Manager,
East African Railways & Harbours

Sir Michael Barrington-Ward

Member, Railway Executive,
who retires on October 1

Sir Michael Barrington-Ward, C.B.E., D.S.O., M.Inst.T., K.C.V.O., Member of the Railway Executive, who is retiring on October 1, was educated at Westminster and at Edinburgh University, where he took his engineering degree. He joined the Midland Railway in 1907 and became an Assistant Engineer on the staff of the Engineer-in-Chief. While in that position he was awarded the Miller Prize of the Institution of Civil Engineers. In 1914 he was appointed an Assistant to the General Superintendent. At the outbreak of war he was Captain, South Lancashire Regiment, but was transferred and promoted Major on the headquarters staff of the Railway Operating Division, R.E., on its formation in 1915. Sir Michael Barrington-Ward subsequently became Lt.-Colonel in command of a large group of operating companies; he was awarded the D.S.O. for gallantry, was mentioned in despatches four times, received the French Croix de Guerre, with palm, was cited in French Army Orders and finally was awarded a Brevet Lt.-Colonelcy. In

Mr. L. C. Barron

Appointed Staff Assistant to Motive Power Superintendent, Western Region

Mr. E. E. Cowell

Appointed District Operating Superintendent, Newcastle, North Eastern Region

Mr. H. E. A. White

Appointed District Motive Power Superintendent, Bristol, Western Region

March, 1919, he was appointed Director, Railway Operations, Ministry of Transport. In 1922, he joined the General Manager's staff of the North Eastern Railway, and, in January, 1923, became District Superintendent, Middlesbrough. In 1927 he was appointed Superintendent, Western Section, Southern Area of the L.N.E.R., becoming Superintendent of the whole of the Southern Area in 1939. Sir Michael Barrington-Ward was appointed Assistant General Manager, Operating, in 1942. From 1938 to 1945 he was Chairman of the Railway Executive Committee Operating Committee. He holds the Medal of Freedom with Silver Palm (U.S.A.). He was appointed Divisional General Manager (Southern Area) (L.N.E.R.) in 1945, and, in 1947, became a full-time Member of the Railway Executive. From 1924 to 1928 he was largely instrumental in organising and raising the transportation troops of the Royal Engineers Supplementary Reserve and was Lt.-Colonel commanding the Operating Group, Royal Engineers. In 1938 he was awarded the Operations Gold Medal of the Institute of Transport for a paper entitled "Railway Operation" read before that Institute, of which he was Vice-President from 1945 to 1948. He received the K.C.V.O. in 1952.

Mr. L. C. Barron, Staff Assistant to the Motive Power Superintendent, Eastern Region, British Railways, who, as recorded in our June 12 issue, has been appointed Staff Assistant to the Motive Power Superintendent, Western Region, joined the service of the former Great Western Railway Company at Swansea in 1923. He transferred to the Office of the General Manager at Paddington in 1935, and, in 1946, became Head of the Wages Staff Section, Staff & Establishment Office, where he served as Secretary to the management side of Sectional Councils Nos. 2, 3, 4, and 5 from 1946 until 1951. In that year Mr. Barron was appointed Staff Assistant to the Motive Power Superintendent, Eastern Region, which position he now leaves on taking up his Swindon appointment.

Mr. E. E. Cowell, District Operating Superintendent, Sunderland, who, as recorded in our issue of June 12, has been appointed District Operating Superintendent, Newcastle, North Eastern Region, joined the L.N.E.R. at Norwich in 1924 as a junior clerk. In 1932 he was awarded a traffic apprenticeship by competitive examination and after training in 1932-36 was made Chief Clerk in the Docks Superintendent's Office, Western Docks, Hull. After occupying various positions he was appointed, in 1946, Head of the Superintendent's & Locomotive Running Superintendent's Joint Works &

Mr. T. H. Moffat

Deputy Chief Regional Officer, Scottish Region, 1948-53

Mr. C. J. Chaplin, M.B.E.

Assistant Engineer (Works Maintenance), London Midland Region

Mr. G. J. Corson

Appointed Manager, Traction Division, Crompton Parkinson Limited

Outdoor Section, York. Mr. Cowell's appointment to the position of Assistant District Operating Superintendent, York, was made in 1948, and in 1950 he became District Operating Superintendent, Sunderland.

Mr. H. E. A. White, District Motive Power Superintendent, Neath, who, as recorded in our issue of June 12, has been appointed District Motive Power Superintendent, Bristol, joined the service of the G.W.R. Railway at Swindon as an apprentice and served twelve years in the Drawing Office. In July, 1939, he was appointed Assistant to the Divisional Locomotive Superintendent at Newton Abbot and in September of that year began war service with the R.A.O.C. (T.A.), being promoted lieutenant-colonel in 1941. Transferring to the R.E.M.E. on its formation he obtained experience with infantry and armoured formations in this country before being posted to India, where he ultimately became Deputy Director of Mechanical Engineering, Southern Army. Mr. White returned to railway service in 1945 as Assistant to the Locomotive Superintendent at Bristol, and in December, 1946, was appointed Assistant Locomotive Superintendent, Bristol, which post was later redesignated Assistant District Motive Power Superintendent. In April, 1952, he transferred to Neath as District Motive Power Superintendent, which post he now relinquishes upon his return to Bristol. With the re-forming of the Territorial Army after the war, Mr. White commanded a battalion of the R.E.M.E., and now is on the Reserve with the rank of lieutenant-colonel.

Mr. T. H. Moffat, O.B.E., Deputy Chief Regional Officer, Scottish Region, who, as recorded briefly in our issue of June 5, retired on May 31, began his railway career with the Caledonian Railway in June, 1902, and after training in the Accounts Department was transferred to the General Manager's Office in 1912, where he became General Assistant, and later Personal Assistant, and, in 1922, Principal Assistant to the General Manager. In 1927 he was appointed Managerial Representative for Scotland and Secretary of the Scottish Committee of Directors, London Midland & Scottish Railway, and in 1932 became Assistant Chief Officer for Scotland. In June, 1947, Mr. Moffat was appointed Acting Chief Officer for Scotland, L.M.S.R. and on January 1, 1948, assumed the position he now vacates. During his career he has been associated with many important railway developments. In 1916 he inaugurated and was responsible for the Financial & Statistical Section of the Caledonian Railway and during the war of 1914-18 was also responsible for all questions of Government control relating to that railway company. Mr. Moffat has maintained life long interest in ambulance work and is Chairman of Council, St. Andrew's Ambulance Association.

Mr. Christopher James Chaplin, M.B.E., B.Sc., A.M.I.C.E., Assistant Engineer (Works Maintenance) British Railways (London Midland Region), who, as recorded in our June 19 issue, is retiring as a result of ill health, was educated at St. Paul's School and University College, London. He entered the service at Walsall in 1929 as a draughtsman in the District Engineer's Office, and, in 1933, he was appointed Assistant District Engineer at Bangor, moving to Liverpool in a similar capacity in 1937. He went to Derby in 1942 as Acting District Engineer, Derby South, and was subsequently appointed District Engineer. In 1947 he became District Engineer at Bradford, moving to Euston in 1950, to take up the appointment from which he now retires. Mr. Chaplin was awarded the M.B.E. in the 1944 New Year's Honours List for his efforts in the Liverpool District during the severe snow storms of 1940 and for his subsequent work in restoration of the tracks during the blitz on Liverpool in 1942.

Mr. G. J. Corson, A.M.I.E.E., who has been appointed Manager, Traction Division, Crompton Parkinson Limited, Chelmsford, as from July 1, 1953, in succession to Mr. F. H. Beasant, has been associated with electric traction for a great many years. He was trained in the Engineering Faculty of the University of Bristol, obtaining a Diploma in electrical engineering, and served a graduate apprenticeship with the British Thomson-Houston Company at Rugby. After a number of appointments with B.T.H., Mr. Corson served in the R.A.S.C. and R.E.M.E. during the war, attaining the rank of Major. He returned to the B.T.H. Company and since 1948 has been the Traction Representative located in their London Office, in which capacity he has been responsible for dealing with all of the B.T.H. traction activities which are handled in London and the South of England.

Mr. K. R. Ramanujam, General Manager, Southern Railway, India, proceeded on leave preparatory to retirement on May 15, 1953.

We regret to record the death on June 22, at the age of 79, of Lt.-Colonel A. M. Leake, V.C., F.R.C.S., Administrative Medical Officer of the Bengal-Nagpur Railway, India for 34 years.

Mr. W. J. Moffatt, Technical Inspector General of the Iraqi State Railways, retired on May 31 after over 35 years' service in Iraq.

The Rt. Hon. Alan Lennox-Boyd, Minister of Transport, has appointed Mr. H. C. Crane, M.Inst.T., who is a representative of commerce, to be a member of the Transport Users' Consultative Committee for the London area.

Mr. H. J. Dowling, who retired recently from British Railways as Steamship Superintendent in Belfast, has been appointed by British Road Services Road Haulage Executive as their agent in Northern Ireland.

Mr. E. S. McCracken, General Manager of Prairie Region, Canadian Pacific Railway, headquarters Winnipeg, has retired after 43 years' service. Mr. C. E. Lister, Acting General Manager in Winnipeg since February, 1952, when Mr. McCracken was assigned special duties in Montreal, has been promoted to the post.

Upon the appointment of Mr. C. E. Lister as General Manager for the Canadian Pacific Railway's Prairie Region, the following two further changes are announced by him:—Mr. J. W. Wilkes becomes General Superintendent of the Saskatchewan District at Moose Jaw. He has been Acting Superintendent since February, 1932. Mr. D. M. Dunlop, formerly Assistant Superintendent at Weyburn, Saskatchewan, is promoted to Superintendent of the Moose Jaw division.

Mr. C. R. Dashwood, C.B.E., Chief Accountant of the Western Region, British Railways, formerly the Great Western Railway, is retiring on August 31 next, after 51 years' service.

The Gold Medal of the Institution of Locomotive Engineers will be presented to Mr. R. A. Riddles, C.B.E., Member for Mechanical and Electrical Engineering of the Railway Executive, at the opening General Meeting of the Institution in September next. The Gold Medal, which is the Institution's highest award, will be given to Mr. Riddles for his outstanding contribution to the locomotive engineering profession and also in recognition of the work which has been done by his staff.

Mr. T. Jackson has been appointed Assistant District Passenger Superintendent, Newcastle, North Eastern Region, British Railways.

Mr. W. Clegg, Assistant District Traffic Superintendent, Ayr, Scottish Region, British Railways, has been appointed Assistant District Goods Superintendent, Newcastle, North Eastern Region.

British Railways, Scottish Region, announces the following appointments:—

Mr. A. Baxter, District Inspector, Fort William, to be Stationmaster, Montrose.

Mr. G. Cumming, Relief Stationmaster, Inverness, to be Stationmaster, Leuchars Junction.

Mr. J. Cunningham, Stationmaster, Williamwood, to be Stationmaster, St. Monance.

Mr. F. Paterson, Goods Agent, Port Elphinstone, to be Stationmaster, Abernethy.

Mr. Leslie J. Hugo has been appointed a Director of Alfred Herbert & Co. Ltd.

Mr. G. V. Bloomfield, B.Sc., A.Inst. P., has been appointed Senior Development Engineer on the technical staff of the Hymatic Engineering Co. Ltd.

We regret to record the death on June 21 of Mr. A. F. Bock, formerly Birmingham Manager, Metropolitan-Vickers Electrical Co. Ltd.

Mr. H. E. Jones, former Secretary of the British Engineers' Association, has been appointed Secretary of the British Association of Machine Tool Merchants.

Mr. E. T. Norris, M.I.Mech.E., M.I.E.E., Chief Engineer in the Transformer Department, Ferranti, Limited, has been appointed Consulting Engineer to the company.

Mr. Sydney Player has resigned from the Chairmanship of M.T. Control Gear Limited; he continues as Chairman of the Newall group of companies.

Mr. Thomas Owen Steventon has been appointed a Director of Turton Brothers & Matthews Limited. He has for many years represented the company for the sale of its products in the Midlands and South Wales, and will continue to do so.

The General Electric Co. Ltd. announces the appointment of the following new Directors:—Mr. O. W. Humphreys, Director of the Research Laboratories of the company. Mr. A. L. G. Lindley, General Manager of the Fraser & Chalmers Engineering Works of the company.

XUM

Indian State Railways Dinner

Sir Percival Griffiths on the railways' contribution to the development of Indian nationhood

The annual reunion and dinner of the Indian State Railways (India and Pakistan) was held at the Rembrandt Hotel, London, S.W.7, on Monday, June 29; the chair was taken by Sir Guthrie Russell, a former Chief Commissioner of Railways in India, with Sir Percival Griffiths as the guest of honour.

The following were present:—

Bengal Assam and Oudh & Tirhut: Messrs. D. J. Anderson, R. Bagley, J. H. Bavin, G. S. Bocquet, N. D. Calder, D. Cardew, W. D. Craig, J. V. Elson, C. H. Griffiths, P. L. J. Hands, W. A. Hewitt, H. E. Hypher, F. E. Musgrave, L. V. Pont, H. M. Read, G. A. Rowlerson, F. E. Sheppard, B. G. Smith, F. A. Smith, R. S. Vipan.

Bombay, Baroda & Central India: Messrs. E. C. Armitage, Allan P. S. Bell, Sir Maurice Brayshay, Messrs. A. L. Brice, R. W. F. Butterfield, P. S. Clarke, C. G. Cotesworth, C. St. A. R. Dady, H. R. Eveleigh, P. O. Fox, W. S. Fraser, E. Gardner, R. K. Innes, J. N. A. James, Dr. Khambatta, Messrs. K. Lomas, W. R. Maunder, J. W. Maye, B. H. Mayes, P. D. Mitton, W. J. A. Moore, Lt.-Colonel F. Moseley, Messrs. W. E. Napper, Major A. B. Rogers, Messrs. G. B. Steers, G. T. Simpson, A. W. Crips Villiers.

Bengal Nagpur: Messrs. A. C. Austin, A. H. Bishop, S. W. Bailey, M. D. Cannell, E. A. DuBois, J. E. Embleton, W. E. C. Greenham, W. G. Hornett, W. H. C. Kelland, P. R. Leigh-Bennett, W. K. Orton, J. A. Parker, R. A. Phillips, A. K. Southern, H. F. Simpson, J. A. A. Shea, A. F. Tabraham, D. C. W. Tonkin, J. C. Walsh, W. L. O. Woodhouse.

East Indian: Messrs. C. S. Burke, C. N. Burns, H. Crawshaw, J. C. Gibson, J. R. Hemsley, G. I. Hewitt, H. L. Kelly, T. T. Lambe, Capt. E. M. Padwick, R.E., Messrs. H. W. Puttick, G. Waugh.

Great Indian Peninsula: Messrs. S. Barber, A. J. Bayross, J Clegg, C. M. Cock, W. N. Crimp, R. G. Da Costa, Sir George Cuffe, Messrs. E. L. Ensor, A. J. Frazer, R. J. Harris, W. Hood, Lt.-Colonel R. Horsfield, Messrs. S. Marchant, P. R. Rao, C. I. Routh, Sir Guthrie Russell, Sir Leonard Wilson, Mr. J. M. D. Wrench.

Jodhpur: Messrs. J. C. Lejeune, D. A. Phillips.

Madras & Southern Mahratta: Sir Godfrey G. Armstrong, Messrs. R. de K. Maynard, C. Baldrey, W. O. Browne, N. Carroll, W. Cathrow, E. G. Cullen, K. L. Crawford, V. J. Crow, H. Evans Edwards, W. G. Latham, G. W. Molle, E. Perfect, C. H. S. Saunders, B. J. Tapner, D. O. Thomas.

Nizam's State: Messrs. G. T. Hart, A. J. Pragnell.

North Western: Messrs. H. C. S. Bennett, P. S. A. Berridge, E. Blanchard, C. E. Clerk, B. C. Drummond, G. J. Eades, L. Flatt, W. E. Gelson, C. E. Goldsmith, Sir A. Griffin, Messrs. F. G. Griffith, D. M. Hambly, J. C. Highet, H. Hinton-Cooper, H. W. Huggins, A. Johnson, T. H. B. Jones, E. L. Manico, C. E. Mathieson, Colonel D. McMullen, Messrs. B. Moody, J. W. Ogle, A. A. Pnillips, G. A. Plank, A. M. Sims, H. Sparrow, W. G. Stephens, S. S. Stubbs, Colonel E. B. N. Taylor, Messrs. J. S. Tritton, J. D. Watson, N. C. Watney, F. M. G. Wheeler, C. E. Williams, S. R. Woodmore, F. M. Wardle, J. Wyse, J. S. F. Yates, H. N. Young.

South Indian: Messrs. G. Collingwood, H. J. Crane, A. C. Flower, C. E. Gayes, H. C. Hodgson, E. C. Lightbody, C. R. Martingell, L. N. Mathur, F. S. Morris, C. A. Muirhead, W. R. Oaten, H. A. Reid, J. W. Restrick, V. R. Riley, W. F. Sargisson, H. E. Thompson, J. F. Wright. Guests: Sir William Stanier, Messrs. A. Forbes Smith, Paul Drew.

Sir Guthrie Russell proposed the toast of the Queen, and introduced the guest of honour, Sir Percival Griffiths. Referring to those who had passed away since the last dinner, he mentioned with great regret the recent deaths of Colonel Sir Gordon Hearn, C.I.E., D.S.O., and Lt.-Colonel A. M. Leake, V.C. and Bar, two distinguished men of whom all those who served on the Indian railways should be proud.

Sir Percival Griffiths said he was uncertain of his qualification to speak at this gathering of senior railwaymen except perhaps as a Director of the Barsi Light Railway. Some of his hearers were like Kipling's Battleby Tring, who

> ". . . had laboured from boyhood to eld
> On the lines of the East and the West and eke of the North and South;
> Many lines had he built and surveyed—important the posts which he held;
> And the lords of the iron horse were dumb when he opened his mouth."

He himself was in the position of:

> ". . . a colonel from Chatham who managed the Bhamo State line, The which was one mile and one furlong—a guaranteed twenty-inch gauge."

Recalling that 1953 was the Indian railway centenary year, Sir Percival Griffiths described the contribution of the railways not only in the national, but also in the moral progress of the sub-continent. In the 1850s, India was still emerging from the period of chaos that followed the Mogul Empire. The sense of nationhood then hardly existed, and political development of India and the growth of the sense of nationhood in what today were the Republic of India and the Dominion of Pakistan were due partly to the English language, partly to a common administration until 1947, and partly to the facilities for travel provided by the railways. The development of the railways had facilitated central administration; the Mogul Empire under Aurangzeb had decayed because as it expanded its lines of communication grew too long when the means of transport were insufficient. Again, in consolidating the new independent India in and after 1947, Sardar Vallabhai Patel had found the railways of the utmost importance in accomplishing his task.

Conquest of Famine

The railways, Sir Percival Griffiths continued, were the first impact of the mechanical skill of Britain on India. Soon after construction, in the 1860s, began, they had helped to allay and even to conquer famine; it was significant that one of the greatest famines, that of Orissa in 1866, occurred in a region devoid of railways, whilst that of 1943, in Bengal, was due to causes connected with the war.

Co-operation between Britain and Indians had begun largely with the railways in very early railway days. British investors had shown their faith; as time went on Indians were trained to run and manage what became a joint venture and now almost was a wholly Indian one.

Assam Link

The railways of India and Pakistan today, Sir Percival Griffiths went on, showed the spirit of determination and enterprise they had displayed so long in the past. This was evinced in the Assam Link railway, constructed by India in the face of great natural difficulties and quickly repaired after heavy flood damage.

The consequences of the war still were felt on some parts of the railway system, not only in Assam, and the railways had been subject to great strain at the time of, and immediately after Partition. Today, however, they were playing a vital part in the industrialisation of the country.

All those who had worked for the railways, Sir Percival Griffiths concluded, had reason to be proud of what they had helped to accomplish in developing the prosperity and nationhood of India and Pakistan.

Enfield Wind-Driven Generator

A wind-driven generator of 100 kW. being built for the British Electricity Authority, is in course of erection at St. Albans. The design is the result of collaboration between the English Electric Co. Ltd., de Havilland Propellers Limited, the principal sub-contractors, and Enfield Cables Limited. The machine is being installed for trials, before erection on a permanent and more exposed site, and is the outcome of four years' work by the designers following a decision in 1949 to adapt and develop the depression principle of blade construction.

The electrical equipment consists of a 100 kW., 415 V. 3-phase synchronous induction generator with exciter, which is started from rest as an induction motor. When synchronous speed is approached, d.c. current is fed into the field, causing the generator to operate as a synchronous motor under no-load conditions; air is then admitted to the turbine, which in turn drives the motor in synchronism with the connected system.

The hub structure is of fabricated aluminium alloy faired with aluminium sheet and encloses the feathering mechanism and oil-immersed main bearings. The two propellor blades are of aluminium alloy, the pitch being adjusted automatically by hydraulic mechanism, so that rotational speed is constant when the wind speed is in excess of 30 m.p.h. and not more than 65 m.p.h. The axial flow, vertical axis, single-stage turbine has a capacity of 50,000 cu. ft. of air per min.

The tower is 100 ft. to the axis of the propeller and weighs approximately 40 tons 10 cwt. To overcome the problem of corrosion due to exposure, the structure has been sprayed with aluminium in metal form. The output increases from zero at wind-speed of 17 m.p.h. up to 100 kW. at 30 m.p.h., and remains constant until the wind reaches 65 m.p.h., when the plant shuts down. There would appear to be considerable possibilities for this equipment, especially overseas where in many places power distribution is not available.

WOODHEAD TUNNEL PROGRESS.—A ceremony was held in the Woodhead Tunnel on June 26 to mark the making of the final mix of concrete for lining the bore. Sir Andrew MacTaggart, Chairman of Balfour Beatty & Co. Ltd., the contractor, pressed a button for the last mix to begin. It is hoped that the tunnel will be handed over by the contractor to the Eastern Region in some six weeks so that work can begin with laying tracks and erection of overhead equipment for the next stage in the Manchester-Sheffield-Wath electrification scheme.

New Car Ferry Terminal at Dover

Official opening by Minister of Transport

The Minister of Transport, Mr. Alan Lennox-Boyd, performed the opening ceremony at the new Dover Harbour Board ferry terminal for road vehicles at the Eastern Docks, Dover, on Tuesday last. The terminal will be brought into full operation tomorrow (July 4).

Among those present at the ceremony were:—

British Transport Commission: Lord Hurcomb, Chairman, and Mr. M. H. B. Gilmour, Chief Solicitor & Legal Adviser.

Railway Executive: Mr. John Elliot, Chairman; Sir Michael Barrington-Ward and Mr. David Blee, Members.

Southern Region Messrs. R. P. Biddle, Docks & Marine Manager, Southampton; R. E. Sinfield, Continental Superintendent; H. J. Bourn, Assistant Continental Superintendent; W. H. F. Mepsted, Commercial Superintendent; F. D. Y. Faulkner, Public Relations & Publicity Officer; and K. R. Ellson, Public Relations Assistant.

Mr. H. T. Hawksfield, Chairman of the Dover Harbour Board, proposing the toast of the Minister, said that they were very grateful to Mr. Alan Lennox-Boyd for coming to Dover. He also welcomed guests representing Continental, transport, tourist, trading, local and other interests, and then briefly outlined the composition and history of the Dover Harbour Board and its efforts towards the development of services. The new Car Ferry Terminal would give motorists a facility not unworthy of the port.

Mr. Alan Lennox-Boyd, in responding to the toast, congratulated the Dover Harbour Board on its great spirit and public enterprise, and praised all concerned in the construction of the terminal. After cutting a ribbon across the roadway at the shore end of one of the loading bridges, he drove on board the ss. *Dinard* and then opened and inspected the Reception Building.

Hitherto, cars have been handled by crane, except at the Train Ferry Dock, where the direct loading facilities provided for the train ferries were used by a number of cars proceeding to Dunkirk.

Construction of the new terminal began in 1951, and with its inauguration the car-ferry vessels will operate from the Eastern Docks, where the greater proportion of the traffic will be handled.

Today the Channel crossings are served by specially-designed car-carrying vessels with passenger accommodation, including British Railways' *Lord Warden* (capacity 130 cars) and *Dinard* (80 cars) to and from Boulogne, the *Halladale* (55 cars) of Townsend Bros. Ferries Limited, to and from Calais, and the Belgian Marine's *Prinses Josephine Charlotte* (120 cars), to and from Ostend. All have stern loading facilities to permit direct drive on and off the vessels on each side of the Channel. During the summer there will be seven arrivals at and seven departures from the terminal daily.

The Car Ferry Terminal is capable of handling all the traffic envisaged for several years. Accommodation is provided for two vessels to load or discharge simultaneously.

Access from the shore to each loading berth is by a short ramp leading from the Car Park to the loading bridge, and from there to the ship's deck over a short link span. The bridges, which are 140 ft. long, are hinged at the land end and are raised or lowered at the seaward end by means of hoisting machinery situated in the reinforced concrete portals.

There is a spacious customs examination hall, with 42,000 sq. ft. of covered accommodation, planned to handle 240 cars an hour.

In the main hall of the reception building are a bank, post office, buffet, shop, telephones, offices for transport operators, waiting and cloakrooms for passengers, and, on the upper floors, office accommodation for the Government departments and others concerned. There are two car parks for reception or marshalling.

Eighth Pan-American Railway Congress

Meetings in Washington and Atlantic City

The Eighth Pan-American Railway Congress, of which some particulars were given in our June 12 issue, was held in Washington and Atlantic City from June 12 to 25. The Chairman was Mr. James G. Lyne, President of the Simmons-Boardman Publishing Corporation.

The organising committee, whose Executive Secretary was Mr. Loyd J. Kiernan, Manager of Special Studies, Association of American Railroads, numbered some 50 members, including heads of leading American railways. The organisers sent out a list of 147 subjects on which they were willing to receive papers, grouped under six main headings. The congress was attended by representatives of the governments and railways of the 21 countries including the United States, which are members of the Association.

Many of the delegates also attended the convention of the Railway Supply Manufacturers' Association which opened in Atlantic City on June 21. They were there able to see the demonstration Talgo train built by the American Car & Foundry Company.

In the upper illustration alongside the following representatives from Argentina are seen from left to right: Col. C. Basile, Ministry of Transport; Eng. H. N. Junor, Empresa Nacional de Transportes; Eng. A. J. Galofre, Ministry of Transport, Mr. Geraldo Cejas, General Roca Railway.

The Brazilian delegates in the lower illustration are: back row, left to right, Eng. A. Pereira; Eng. J. da Cunha, North Eastern Railway; Eng. A. Guimaraes, Eng. H. Bachareis. Those in the front row are Mr. E. Johansson; Eng. E. Lugarinho; Eng. G. de M. Gomes; and Eng. J. de Souza, President, Traction Committee, Technical Institute of Economic Studies.

Representatives of Argentina at the Congress

A group of Brazilian delegates

The "Elizabethan" Inaugurated

The inaugural run took place on June 29 of the "Elizabethan" which operates non-stop until September 12 between London (Kings Cross) and Edinburgh (Waverley), conveying through coaches to Dundee and Aberdeen. The 392¾ miles to Edinburgh are covered in 6¾ hr. entailing an average speed of 58 m.p.h. and making the run the world's longest daily non-stop journey. The northbound train leaves Kings Cross at 9.35 a.m. and reaches Edinburgh at 4.20 p.m.; the Aberdeen portion arrives at Dundee (Tay Bridge) at 6.44 p.m. and Aberdeen at 8.38 p.m. Scheduled timings for the southbound train are:—

Aberdeen	dep. 5.50 a.m.
Dundee Tay Bridge	dep. 7.45 a.m.
Edinburgh Waverley ...	dep. 9.45 a.m.
Kings Cross	arr. 4.30 p.m.

The service is thus 21 min. faster northbound and 22 min. faster southbound than that given last summer by the "Capitals Limited," which it supersedes.

Although the streamline "Coronation" before the war took only six hours between London and Edinburgh with two stops, the "Elizabethan" has the fastest schedule for the non-stop working. The "Flying Scotsman" began to run non-stop to Edinburgh in 1928, taking 8½ hrs.; in 1939 the time was seven hours.

Composition of Train

The "Elizabethan" is made up of eleven coaches weighing about 400 tons and is worked by one of the Class "A.4" Pacifics with corridor tender. As before on non-stop runs the crew from Haymarket Depot (Edinburgh) travel as passengers from Kings Cross to Tollerton, north of York, where the Kings Cross men are relieved; the latter return to the train and continue the journey as passengers to Edinburgh.

The stock used is that built for the East Coast route by the L.N.E.R. after the war and refurbished for the new service. Both restaurant and buffet cars and ladies' retiring rooms with attendants are included. Seats are reservable in advance.

The northbound "Elizabethan," hauled by locomotive No. 60028, *Walter K. Whigham*, was seen off at Kings Cross on June 29 by a party which included Mr. John Elliot, Chairman, and Sir Michael Barrington-Ward, Member, the Railway Executive, and Mr. C. K. Bird, Chief Regional Officer, Eastern Region, and was welcomed on its arrival at Edinburgh some four min. early by Mr. T. F. Cameron, Chief Regional Officer, Scottish Region. Travelling on the train were :—

Messrs. R. F. Harvey, Chief Officer (Motive Power), Railway Executive, L. P. Parker, Motive Power Superintendent, J. Dunger, Assistant Commercial Superintendent (Passenger Train Services), Eastern Region, E. W. Rostern, Operating Superintendent, Eastern and North Eastern Region), G. W. Stewart, General Assistant to Chief Regional Officer, M. B. Thomas, Public Relations & Publicity Officer, and F. A. Gilberthorpe, Restaurant Car Superintendent, Eastern Region, and press representatives.

A dinner to mark the occasion was given to members of the Press by the Scottish Region at the North British Hotel, Edinburgh, and presided over by Mr. T. F. Cameron. Mr. Cameron introduced Mr. T. H. Hollingsworth, Commercial Superintendent, Scottish Region, who proposed the toast of the guests, to which Mr. Charles F. Klapper, Editor, *Modern Transport*, replied.

New Ferry Berth at Zeebrugge

The new berth of the Société Belgo-Anglaise des Ferry-Boats, S.A., in the outer harbour at Zeebrugge, was formally inaugurated on June 27. The bridge is about 160 ft. long, hinged in the middle, and electrically operated. A new yard built adjacent to the ferry berth assists the shunting of ferry wagons for embarkation and the formation of trains of wagons disembarked. A roadway is provided, with tracks decked over the bridge to enable road vehicles to be driven on and off the ferries. A new building adjacent houses the ferry offices and store.

The new installation is designed to replace the berth built 30 years in the basin on the Canal Maritime leading to Bruges ; the latter necessitates passage through a lock, and berthing is possible only 1½ hours after entering harbour. Use of the new berth reduces the turnround time of ferry-boats by 3 hours. It was designed by the consulting engineer, Monsieur Joseph Lagrou. The civil engineering work was carried out by the Société d'Études et de Travaux S.E.T.R.A., and the bridge and equipment by the Société Métallurgique d'Enghien—St. Eloi.

Perishable Traffic to U.K.

A feature of the Harwich-Zebrugge ferry service is the large amount of fruit and vegetable traffic consigned to Britain. On June 27 the *Norfolk Ferry* sailed at 11.15 a.m. with 8 wagons of fruit from Italy, 3 of bilberries from Jugoslavia, 6 tank wagons of acid from Germany, 12 wagons of machinery from Germany and one from France, and 10 wagons with miscellaneous loads from Belgium, or her complement of 40 wagons in all. The order to sail was given by Monsieur P. W. Segers, Minister of Communications.

After the departure, the inaugural function was held in the new office building. H.M. the King of the Belgians was represented by Colonel Ecuyer Jacmart. Monsieur F. Osterrieth, Chairman of the Société Belgo-Anglaise des Ferry-Boats, expressed his company's pleasure at the presence of the British Railways delegation headed by Sir Michael Barrington-Ward, member of the Railway Executive.

Monsieur Segers drew attention to the foresight of King Leopold II and his successors in fostering the growth of the port of Zeebrugge. He thanked all who had made the service a success, including Captain R. Davis, Manager (Shipping Services), Eastern and N.E. Regions.

British Railways Part in Development

Sir Michael Barrington-Ward reminded his audience that less than two years ago they had celebrated the entry into service of the *Norfolk Ferry*, the second of the two new ships built for this service since the war. He emphasised the good work of the Belgian National Railways and of the S.B.A. des Ferry-Boats, and the importance of traffic between Britain and the Continent without break of bulk.

These works were evidence of the determination of their Belgian friends to develop throughout transport by rail between the Continent and Great Britain, a determination like that displayed in 1945 when with such courage they undertook the task of clearing the wrecked port of Zeebrugge. British Railways would continue to collaborate to foster the interests of this enterprise. They had under consideration the construction of a third new train ferry to replace the old *Essex Ferry*.

Others present included :—

Messrs. J. Petersen, representing the British Ambassador; Behogne, Minister of Public Works; C. K. Bird, Chief Regional Officer, Eastern Region; L. H. K. Neil ; Captain R. Davis ; Messrs. T. R. Hawkes, Accountant, Eastern & N.E. Regions; H. C. Talbot, British Railways Representative, Brussels ; M. de Vos, General Manager, Belgian National Railways ; and H. Robyn.

British Railways Travel Centre

The new West End of London office opened on June 23

Parliamentary Notes

Road Goods Vehicles Speed Limit

Mr. Alan Lennox-Boyd (Minister of Transport) said in the House of Commons on June 23 that he had decided that the time was not opportune for him to increase the speed limit of heavy goods vehicles from 20 to 30 m.p.h.

Answering questions from some Conservative Members, Mr. Lennox-Boyd said that both he and his predecessors had been urged strongly by representatives of the manufacturers and users of heavy goods vehicles to increase the speed limit. The change had been powerfully argued both on the ground of economic use of resources at home and as an aid to the sale of vehicles abroad.

He did not think, however, that any action on his part to raise the limit could be effective without agreement in the industry as to the changes in existing arrangements which might follow.

Transport Charges in the Highlands

Mr. Alan Lennox-Boyd, Minister of Transport, answering questions in the Commons on June 22 as to steps being taken to keep down high transport costs from the Scottish Highlands and islands, said he was aware of the particular problems. When the B.T.C. produced its merchandise charges scheme, those who were not satisfied by it could have recourse to the Transport Tribunal and, under the recent Act, there might be a measure nearer local autonomy in regard to charges.

Asked whether he accepted the general findings of the Cameron Commission, and, if so, what action did the Government propose to take on them, Mr. Lennox-Boyd replied that as the Cameron Commission reported on action which must be taken by another authority, he thought it would be inappropriate for him to give a decision.

Iron & Steel Act Appointed Day

Mr. Duncan Sandys (Minister of Supply) said in answer to a question on June 29 that he could not accede to the suggestion that the Appointed Day under the new Iron & Steel Act should be postponed until the next General Election. Before fixing the date, he had sought the advice of the Chairman of the Iron & Steel Board and the Chairman of the Agency. Their joint recommendation was that the Appointed Day should be either July 6 or July 13. Out of regard for the views of the Opposition, he had selected the later date.

Railway Rolling Stock Programme

Mr. Duncan Sandys, replying to a question on June 29, said there had been an improvement in the deliveries of plates and forgings for railway rolling stock, and he understood that had enabled the Railway Executive to restore part of the cut they had been obliged to make in their rolling stock production programme.

Later, he was asked, in view of the fact that at present the Railway Executive was using many carriages 40-50 years old, to do his utmost not merely to restore the cuts, but to give the B.T.C. a full allocation in its requirements for the whole of the programme. He replied that that was the aim of the Government.

B.T.C. Staff Compensation

Mr. H. Hynd (Accrington—Lab.) was informed on June 29 by Mr. Gurney Braithwaite (Parliamentary Secretary to the Ministry of Transport) that the Minister of Transport, Mr. Alan Lennox-Boyd, hoped to lay the draft regulations governing staff compensation under the Transport Act, 1953, before both Houses of Parliament before the middle of July.

Mr. Hynd asked if the Parliamentary Secretary would remind the Minister of Transport of the undertaking given in the House on November 17 that the regulations would be published before the disposal of the road haulage vehicles started. Mr. Braithwaite said he thought that would occur under these arrangements.

Helicopter Passenger Services

Mr. Duncan Sandys, in answer to a question on June 27, said that two types of twin-engine helicopter suitable for passenger service were being developed under Ministry of Supply contracts. The scale of production depended on the volume of orders. The Government was well aware of the importance of the helicopter and doing everything possible to encourage its development and production.

Coal Supplies

Mr. Geoffrey Lloyd (Minister of Fuel & Power), replying to questions on June 29, said that as a result of the Coronation about 1,250,000 tons of coal had been lost, and it was estimated that the second week's holiday which the miners were taking for the first time this year would lose a further 3,500,000 tons.

This was the crux of the coal difficulty, and the problem was how to offset the loss by increased output. He had been in constant touch with the National Coal Board, and assured the House that efforts would continue to be made to raise stocks before the winter.

NEW ROAD VEHICLE MAINTENANCE DEPOT AT EDGE HILL.—To provide increased maintenance facilities for London Midland Region road vehicles, a portion of a large steel-frame building is being transferred from Fleetwood and re-erected at Edge Hill, Liverpool. It will be equipped with vehicle lift, charging facilities for batteries, electric drills, and other garage fittings. The existing depot at Edge Hill was first used in 1931 to deal with 50 vehicles and trailers. Today there is a fleet of 142 vehicles and 270 trailers.

British Railways Rolling Stock Programme

British Railways are to build 288 locomotives, 1,448 carriages and 42,641 wagons during 1953, providing the full allocation of materials is received. This programme includes locomotives and rolling stock authorised during previous years but not built owing to shortage of materials, together with part of the normal 1953 programme of construction.

The 288 locomotives will include 209 steam, 1 diesel-electric main line unit, 51 diesel-electric shunters of the new standard type, 14 diesel-mechanical shunters, and 13 electric locomotives for the Manchester-Sheffield-Wath services. Of the steam locomotives, 150 will be of new standard B.R. designs and 59 of existing regional types: the first ten of a new 2-10-0, class "9"—the most powerful locomotive yet designed by the unified British Railways and the first standard type to be designed exclusively for heavy freight traffic—will be included in the 150 standard locomotives.

Most of the carriages will be of the new standard B.R. all-steel designs, but 292 will be of regional non-corridor types, for which much of the material is already on hand. A feature of the wagon-building programme is the provision of 1,200 wagons, of capacities ranging from 12 tons to 42 tons, for conveying steel; other features are 113 wagons ranging from 12 to 135 tons capacities for special types of traffic, and 2,324 wagons with shock-absorbing gear. Twenty-five per cent of all the wagons, including most of the general merchandise types, will be fitted with vacuum brakes to enable them to run in express freight services.

LOCOMOTIVE RENEWAL PROGRAMME

Number	Type	Loco. number	Building works
10	Standard 2-10-0 class "9"	92000—92009	Crewe
7	" 4-6-2 class "7"	70038—70044	"
22	" 4-6-0 class "5"	73030—73051	Derby
25	" 4-6-0 class "4"	75020—75024 75030—75049	Swindon
25 (14 + 11)	" 2-6-0 class "4"	76006—76019 76024—76034	Horwich Doncaster
10	" 2-6-0 class "3"	77000—77009	Swindon
11	" 2-6-0 class "2"	78004—78014	Darlington
20	" 2-6-4T class "4"	80059—80078	Brighton
20	" 2-6-2T class "2"	84000—84019	Crewe
150			
51 (29 + 22)	" 0-6-0 350 h.p. diesel-electric shunting " " " "	13015—13043 13060—13081	Derby Darlington
13	L.M.R. 2-6-0 class "2"	46515—46527	Swindon
5	" 0-4-0T class "0"	47005—47009	Horwich
41	W.R. 0-6-0T	3400—3409 9490—9499	Hunslet Engineering Co. Ltd.
59		8430—8449	W. G. Bagnall Ltd.
		9489	Robt. Stephenson & Hawthorns Limited
1	S.R. Main-line diesel-electric	10203	Brighton Works, B.R.
11	0-6-0 200 h.p. diesel-mech.	11105—11115	Drewry Car Co. Ltd.
3	0-4-0 153 h.p. diesel-mech.	11500—11502	Hunslet Engineering Co. Ltd.
14			
	Manchester/Sheffield/Wath electric		
6	Bo-Bo	26052—26057	Gorton
7	Co-Co	27000—27006	
13			

Contracts & Tenders

An order has been placed with P. & W. Maclellan Limited for 100 broad gauge covered goods wagons, "Ch" type, for the Pakistan railways.

British Railways, North Eastern Region, have placed the following contracts:—

John Pickles & Son (Engineers) Limited, Hebden Bridge: one automatic boring machine and one crosscut saw for West Hartlepool Sleeper Depot.

Dorman Long & Co. Ltd., Bridge Department, Middlesbrough: replacement of six bearings and grillages, Bridge No. 13, Dutch River, Goole, Hull and Doncaster branch.

H. Morfitt & Son Ltd., Leeds, 6: Sunderland, Monkwearmouth Goods Office. Supply and installation of central heating.

Edgar Phillips Limited, West Hartlepool: Electric lighting installation at West Hartlepool passenger station.

British Railways, London Midland Region, have placed the following contracts:—

Leonard Fairclough Limited: Clay digging and drainage at Charwelton, 134 miles to 134 miles 583 yd., and drainage and formation renewal at Woodford Halse, on the down line from 135 miles 880 yd. to 135 miles 1,320 yd.

William Freer Limited, London, W.C.1: Installation of heating and hot water services at St. Pancras Way road motor workshops.

Henry Hope & Sons, Birmingham: Renewal of roof coverings with patent glazing at the south end of Rugby Midland station.

Truswell & Son Limited, Newcastle, Staffs.: Heating in the brass finishing shop, offices and workshops at Crewe Locomotive Works.

W. H. Heywood & Co. Ltd., Huddersfield: Patent roof glazing of the engine shed roof at Heaton Mersey Motive Power Depot.

Mellowes & Co. Ltd., Sheffield: Repairs and renewals to the roof, with patent glazing, of the points and crossings shop at Crewe Locomotive Works.

The Portuguese Railways announce in the annual report for 1952 that they intend to call for tenders for the electrification of the Lisbon-Sintra and the Lisbon-Entroncamento lines by the end of the present year. Electrification in Portugal formed the subject of an editorial note in our June 19 issue.

The Special Register Information Service of the Board of Trade, Commercial Relations & Export Department, states that the British Legation, San Jose, Costa Rica, has informed it of a notice affecting the original call for tenders for electric locomotives for the Pacific Electric Railway (see our June 5 issue). A translation of this notice (for which the Department accepts no responsibility) is as follows:—

"All possibly interested in Call for Tender No. 3428 'Electric Locomotives for the Ferrocarril Electrico Al Pacifico,' published in the [official] *Gazette* of May 1, 1953, are advised to take into account the following modifications. Basic characteristics of the locomotives: Air compressor with capacity not less than 48 cubic metres an hour, effective 800 litres a minute against 8 atmospheres. Minimum storage capacity of compressed air in the locomotives 800 litres. Characteristics of the line: A plan has been prepared of the entrance of the Cambalache tunnel, through which the locomotives must pass, which may be of a great use in the design and calculation of maximum dimensions of the locomotives and their pantographs. This plan may be obtained at cost price in the office of the Electric Department of the railway, by agents interested in participating in this tender."

Notes and News

Assistant Traffic Superintendent Required.—A senior assistant traffic superintendent is required by the Malayan Government Railway for a three-year tour. See Official Notices on page 27.

Gas Turbine for Exhibition Lighting.—An industrial gas turbine of the latest design is to be sent to Olympia by Ruston & Hornsby Limited to run on load and supply power for much of the lighting in the three main halls at Olympia during the Engineering & Marine Exhibition from September 3 to 17. The machine is of the latest Ruston design, Mark "TA," now being batch produced at the company's Lincoln works. It is a lightweight, adaptable industrial turbine of 750 to 1,000 kW. output, and is being supplied for service on a range of fuels, including diesel oil, natural gas, and coal tar fuel.

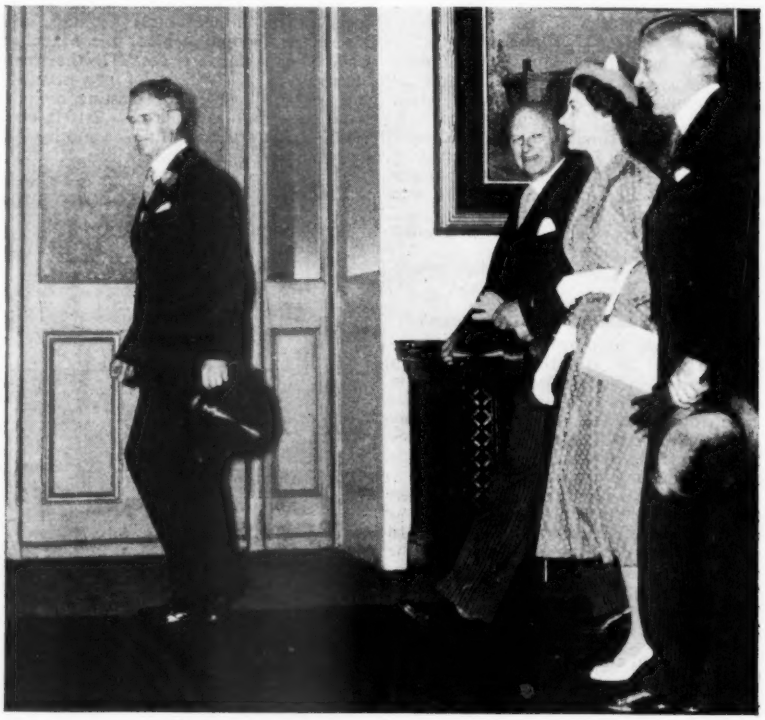
"Princess Victoria" Report.—Referring to the report on the loss on January 31 of the B.R. vessel, *Princess Victoria*, Lord Leathers, Co-ordinating Minister for Transport, Fuel & Power, said in the House of Lords on Tuesday that the findings of the report were still being studied. The Minister of Transport had no intention of ordering a re-hearing of the case, but in due course there would be a full debate. The B.T.C. had three weeks from last Wednesday to decide whether to appeal against the accusation of default. Lord Balfour of Inchrye said he understood the Commission's normal liability would amount to about £40,000, but if negligence was proved it would be much greater.

Forestal Land, Timber & Railways Company.—Treasury consent has been received to the proposal to make a scrip issue to shareholders of 927,209 £1 ordinary shares of the Forestal Land, Timber & Railways Co. Ltd. in the proportion of one for every four stock units or bearer shares held.

Flood Damage to Swiss Railways.—Torrential rains recently caused flooding of several stretches of line in Eastern Switzerland, notably in the cantons of Zurich, Schwyz, and Glaris. On the main Zurich-Winterthur-St. Gall line, single-line working was necessitated after a passenger train was derailed, though without casualties.

Savings in Nationalised Industries.—Figures issued by the National Savings Committee show that membership of savings groups on British Railways and the Hotels Executive totalled 61,697 at the end of March, and that their six months' savings amounted to £360,738. London Transport savings group membership was 22,374 with savings for six months of £128,641. In the Road Haulage Executive there were 8,089 members of savings

H.M. The Queen at Euston



H.M. The Queen passing the Great Hall at Euston on the way to join the Royal Train for Edinburgh on June 22. On Her Majesty's right is Mr. John Elliot, Chairman, and on her left Sir Michael Barrington-Ward, Member of the Railway Executive. Mr. H. S. Turrell, Station Master, Euston, is on the left

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

THE Government of India, Railway Board, is inviting tenders for the 1954/55 Rolling Stock programme. Full details can be obtained from: The Director-General, INDIA STORE DEPARTMENT, Railway Branch, 32/44, Edgware Road, London, W.2. The requirements include the following: 240 Steam Locomotives. 8 Diesel Locomotives. 9,316 Wagons including tank wagons. 22,800 Pairs Wheels and Axles. 23 Locomotive boilers. 44 Railway cranes, steam and diesel. 45 Steel locomotive fireboxes. 60 Bogie carriage underframes. 50 Electric motor and trailer coaches. 24 Lightweight Railcars. 30,000 Tons Steel Sleeper Bars. 8,550 Tons Steel plates, sheets and billets.

VACANCY in Instrument Department (mainly speed indicators and recorders) of old established Westminster Company, for man aged around 25/30 with commercial experience and preferably some knowledge of mechanical, electrical and aeronautical engineering. Commencing salary about £600/£800 per annum, with good prospects. Write full particulars to Box 885, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

SENIOR ASSISTANT TRAFFIC SUPERINTENDENT required by MALAYAN GOVERNMENT RAILWAY for 3-year tour with prospect of pensionable employment. Salary, etc., equivalent to £1,218 a year rising to £2,100 a year for single men. Additional allowance up to £630 a year for married men according to salary and dependants. Commencing salary according to experience. Free passages. Liberal leave on full salary. Candidates must be A.M.Inst.T. or hold equivalent professional or academic qualifications. They should have served as Special Apprentices with a Railway and had considerable subsequent experience in Traffic Operating and Commercial work, with sound knowledge of modern rating practice. Write to the CROWN AGENTS, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3B/33378/RA.

THE PERUVIAN CORPORATION have the following vacancies on the railways in Peru:—Central Railway. ACCOUNTANT (Traffic Auditor). About 30 years of age, preferably single with general auditing and railway accounting experience. Northern Railways. DIESEL ENGINEER with practical experience on diesel locomotives and railcars and workshop management. Southern Railway. ASSISTANT CHIEF STOREKEEPER—an experienced Railway Storekeeper with a knowledge of Spanish essential. A knowledge of the Spanish Language is preferable in all these appointments or willingness to learn within 6 months. Apply: SECRETARY, 144, Leadenhall Street, London, E.C.3.

THE GAS-TURBINE LOCOMOTIVE. A technical description of the gas-turbine recently constructed by the Metropolitan-Vickers Electrical Co. Ltd. for the Western Region, British Railways. Subjects dealt with include body construction, bogies, traction motors, prime mover, generators and auxiliary equipment. A folding plate drawing of the locomotive is included together with illustrations and diagrams. Reprinted from *The Railway Gazette*, February 1, 1952. Price 5*s*. Post free 5*s*. 2*d*. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

INTERNATIONAL RAILWAY ASSOCIATIONS. Notes on the work of the various associations concerned with International traffic, principally on the European Continent. 2*s*. By post 2*s*. 2*d*. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

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N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway. 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10*s*. 6*d*.—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

groups and in the Road Passenger Executive 47,163, their savings for the six months to March 31 being £79,093 and £445,240 respectively.

Wagon Finance Dividend.—An interim dividend of 3d. per £1 share, 4s. paid, has been declared by the Wagon Finance Corporation Limited in respect of 1953. The corresponding dividend in 1952 was 1s. per £10 share, £1 paid. Subdivision of the £10 shares into £1 units took place last October, and the capitalisation of £125,000 from general reserve was applied in paying up a further 2s. per share, making 4s. paid.

Institution of Civil Engineers Awards.—A Crampton Prize has been awarded by the Council of the Institution of Civil Engineers to Mr. P. A. Scott, B.Sc., M.I.C.E. (London), for his paper "A 75-in. dia. Water Main in Tunnel: A New Method of Tunnelling in London Clay." Among Telford Premiums awarded is that to Mr. P. W. Rowe, Ph.D., A.M.I.C.E. (Manchester), for his paper "Anchored Sheet-Pile Walls."

Ribble Motor Services Limited.—The group revenue of Ribble Motor Services Limited for the year to March 31 last was £4,475,421, compared with £4,143,639 for the preceding year. Operating, maintenance and administrative expenses totalled £3,816,552. The profit, after tax deductions, was £217,235 (£349,909). A final ordinary dividend has been declared of seven per cent on increased capital, making 17 per cent. The annual general meeting was held on July 2.

Marcroft Wagons Limited—In his statement issued with the report for 1952 of Marcroft Wagons Limited, the Chairman, Major Noel E. Webster referred to the effect on the results of the further 2½ per cent reduction in the repair schedule, which he had mentioned a year ago. The result was that despite further reorganisation and increase in capital expenditure on plant and the equipment of their works amounting to some £12,000 nevertheless the ratio of profit had fallen slightly. As a consequence the net profit for the year of £32,615 was £1,780 less than for the year to December, 1951. He was pleased to say that the efficiency of their organisation and the co-operation of their workpeople continued in a most happy manner to promote the interests of all concerned with their activities, including British Railways, and that a steadily increasing flow of work was received from other users of rolling stock.

Hurst Nelson & Co. Ltd.—The net profits for the year to March 31 last amounted to £40,173 against £43,838 a year ago, when tax provisions no longer required of £35,000 were added. The ordinary dividend of 15 per cent less tax compares with 20 per cent last year; and there is proposed, in addition, a further 2½ per cent not subject to tax, payable from dividend reserve created in previous years out of capital profits.

San Paulo (Brazilian) Railway Company.—Although a surplus of £503,000 of current assets over current liabilities in Brazil and England is shown in the balance sheet of the San Paulo (Brazilian) Railway Co. Ltd. for 1952, the Chairman, in his review of the year, explains why the directors could not justify any substantial capital reduction by way of return of cash to shareholders. Such a reduction would require application to the Court, and in this application provision for claims against the company must be shown at their total amount, however unreasonable they may be considered to be. There had been no material change in the position since last September, when a capital repayment of 3s. 4d. per 10s. unit was made.

Buenos Ayres Western Railway Distribution.—Sir Bernhard Binder, joint liquidator of the Buenos Ayres Western Railway, announced at a general meeting in London on June 25 that a further interim distribution of £5 per cent would be made on August 20. He could not yet give a definite date when the liquidation would reach finality, but the indications were that the long task was showing signs of coming to an end. The agreement to sell the British-owned Argentine railways to the Argentine Government for £150 million was concluded in 1947. The companies went into liquidation and most of this compensation had been paid out by the end of 1948. Since then, the liquidators had been discussing outstanding matters with the Argentine authorities, settling claims and so on, and realising remaining assets not included in the sale agreement.

Forth Road Bridge : No Early Start.—Mr. Alan Lennox-Boyd, Minister of Transport, stated recently in Edinburgh that he could not authorise in the immediate or near future the starting of constructional work on the Forth Road Bridge. If it were to go on, every other road project in Scotland would have to be abandoned.

British Railways Coal, Iron & Steel Traffic.—British Railways cleared 3,191,150 tons of coal from deep-mined pits and opencast sites in the week ended 6 a.m. on June 29. The weekend figure was 310,730 tons. During the week ended June 20, 228,905 tons of iron and steel from the principal steelworks and 342,000 tons of iron ore were conveyed.

Eastern Region Suburban Train Punctuality.—From Monday to Saturday of the week ending June 20, 1,498 Eastern Region suburban trains carried one-and-a-quarter million passengers to and from Liverpool Street and Fenchurch Street Stations during the morning and evening rush hours. Of these 1,485 (99·1 per cent) arrived on time or under five minutes late.

Threepenny-Piece Ticket Machines on London Transport.—New ticket machines to take twelve-sided threepenny pieces have just been put into operation at South Kensington Station, London Transport. There are three of the machines, two in the District Line hall and one on the Piccadilly Line. Each will accept either a twelve-sided threepenny piece, threepence in coppers, a sixpence, or a shilling in payment for a threepenny ticket. Change, where necessary, is given only in silver and coppers, not in threepenny pieces.

Saunders Valve Equipment.—Among the equipment exhibited at the forthcoming engineering exhibition at Olympia by the Saunders Valve Co. Ltd. will be a series of diaphragm valves, including ebonite valves in a size range of ¼ in., ⅜ in., ½ in., ¾ in., and 1 in., with screwed connections. A new series will also be exhibited, available in five sizes from ¼ in. to 2 in., screwed and flanged type with ebonite body for use in laboratories and chemical factories re-

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quiring non-corrodible valves. The range of Safran centrifugal pumps exhibited will include multi-stage and vertical trunk types, and a 1 in. four-stage pump, the feature of which is the elimination of a high-pressure gland, the only gland is that at the suction eye of the first stage impeller. The impellers are of contra-flow type, whereby the thrust load of the two stages is hydraulically balanced.

Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd.: Change of Name.—The name of Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd. has been changed to Armstrong Whitworth (Metal Industries) Limited, so that the name of the company may be more closely related to its activities and products.

Guest, Keen & Nettlefolds Limited.—At the annual general meeting of Guest, Keen & Nettlefolds Limited in Birmingham on June 25, the Chairman, Mr. J. H. Jolly, said it was still their purpose, as had been noted last year, to purchase the iron and steel works previously connected with the group, subject to fair financial terms on re-acquisition and the extent to which free enterprise might be allowed. They believed that under their management the costs of steel production would be less and its quality for their manufacturing companies would be better than under nationalised control. Reviewing the company's overseas interests, the Chairman mentioned the large quantities of permanent way material for the Indian railways produced at the Calcutta works of their principal subsidiary in India, Guest, Keen & Williams Limited.

N.U.R. Assets Increased.—The assets of the National Union of Railwaymen reached £4·8 million last year, an increase of nearly £196,000 over the 1951 figure. This is described by Mr. J. S. Campbell, Secretary of the N.U.R., as a marked improvement on the decrease of nearly £175,000 in 1951, which was "due to the depreciation of the union's stock holdings caused by the monetary policy of the Government." The market value of the union's stocks again had to be depreciated by £52,000 in 1952, and it was to be hoped that this would not again be a feature of its annual accounts. In all, however, the increase in total assets was "no small achievement."

Record Tourist Figures in May.—Details of tourists arriving in Great Britain during May, given by the British Travel & Holidays Association, show that their number totalled nearly 100,000 or 37 per cent more than in the corresponding month of 1952. This record figure was, of course, the result of the Coronation, and if those who arrived on June 1 or early on June 2 are added, the estimated total of overseas visitors in Britain for the Coronation comes to about 200,000, of whom between 30,000 and 40,000 were Americans. Sir Alexander Maxwell, Chairman of the Association, estimates that more than 800,000 visitors will come to Britain in 1953 and that tourist earnings will exceed £125 million.

B.E.T. Omnibus Services Limited.—At the annual general meeting of B.E.T. Omnibus Services Limited on June 11, Mr. J. S. Wills, Chairman, complained that of the fuel oils used in the country, only that proportion, roughly one-sixth, which was used as fuel for road transport, was subject to tax. The remaining five-sixths, used for various purposes by industry generally, including the railways, was free from tax. He asked why, if a special tax on the main raw material used by an essential service were necessary, there should not be a similar tax on coal used to produce gas or electricity or on the railways. The tax should be done away with altogether; its disappearance would, in the absence of other unexpected burdens, bring to an end the process of increasing bus fares. Since 1929 partnership between road and rail had worked smoothly and well; it had made possible the continued existence of healthy competition between road and rail, at the same time facilitating the co-ordination between the two desirable in the public interest. A similar partnership between private enterprise and the State could be extended, with advantage to the nation's passenger transport services to cover all the provincial undertakings now owned by the British Transport Commission.

Forthcoming Meetings

July 4 (*Sat.*).—Irish Railway Record Society. Half-day visit to the railway system of Arthur Guinness Son & Co. (Dublin) Ltd.

July 7 (*Tues.*) and July 9 (*Thu.*).—Railway Students' Association. Evening visits to resignalling installation between Selhurst Junction and Victoria, British Railways, Southern Region.

July 10 (*Fri.*) to July 12 (*Sun.*).—Industrial Co-Partnership Association, 36, Victoria Street, London, S.W.1. Weekend Conference at Somerville College, Oxford.

July 18 (*Sat.*).—British Railways, Southern Region, Lecture & Debating Society. Ramble over the course of the former Surrey Iron Railway, leaving Coulsdon at 2.15 p.m.

Railway Stock Market

Largely because sentiment was helped by more hopeful views of the international outlook, stock markets generally turned firmer and reflected selective buying of industrial shares. British Funds, however, eased further earlier in the week, War Loan 3½ per cent changing hands almost down to £80¾, which compares with nearly £82¼ reached at one time last month. The reaction in gilt-edged stocks has been due more to slowing down in demand than to selling, which appeared to be very moderate. There is a disposition in the City to await news whether the first of the steel issues is to be postponed until the autumn. Much may, of course, depend on the general trend of markets. If the first issue is to be made in a few weeks, it will mean that information will be provided shortly as to the basis on which British Funds can be exchanged into steel shares.

A factor which has led to an easier trend in the gilt-edged market is the growing belief that recent hopes of an early reduction in the bank rate are unlikely to be realised, though it is widely assumed that by the end of the year the bank rate may be reduced to 3½ per cent or perhaps 3 per cent.

A feature of oustanding strength in foreign rails has been an advance in United of Havana stocks on reports that the sale of the railway may be completed in a few weeks. It is said that all that is needed is an agreement on labour matters between Mr. Wenner-Gren the Swedish millionaire purchaser and the Cuban Government before he can conclude the take-over negotiations with the company. The market is, however, awaiting news whether the purchase money will be paid in one sum or spread over a period. Optimism that in any case the terms will make the various stocks have a break-up value in excess of market prices has been reflected in a sharp advance at the time of writing. United of Havana "A" stock has risen to 70, and the "B" stock at 68 has also moved up strongly, while the 5 per cent second income stock was 24 and the consolidated stock 4.

All the stocks are still below the best levels recorded this year since the capital was reorganised with a view to facilitating any take-over offer that might come along. The highest price touched by the "A" stock has been 74, that for the "B" 69, while the second income stock has been 29 and the consolidated stock was 5⅝ earlier this year.

Antofagasta ordinary stock was 8½ this week and the preference stock 41½. There was again little attention given to Manila Railway stocks in the continued absence of any moves likely to lead to an early payment of arrears on the Manila Railroad bonds, which are the sole asset of the railway company. Manila Railway "A" debentures were 80 and the preference shares 8s., while the 1s. ordinary shares continued to be quoted at 3s. 9d. The ordinary shares are nearly four times their nominal value because of estimates of their break-up value should the bonds of the railroad company be repaid together with their big arrears of interest.

Costa Rica ordinary stock was quoted at 11½ and the 6½ per cent second debentures at 61½. Dorada ordinary stock remained at 47½ and the first debentures at 93½. Guayaquil & Quito bonds were 37½, while International of Central America common shares were $15½. Nitrate Rails shares were 20s. 9d. and Taltal 14s. 6d. Paraguay Ceneral prior lien debentures were 16½. Brazil railway bonds maked 6½, and following publication of the annual report, San Paulo units were 5s. 9d. Among Indian stocks, Barsi was 118½.

Among Canadian rails, Canadian Pacifics strengthened to $47¼; the 4 per cent preference stock was £63½ and the 4 per cent debentures £82½. White Pass no par value shares have fluctuated around $29¼ and the convertible debentures were £104. Algoma Central & Hudson's Bay 5 per cent first income debentures were $239½. Elsewhere, Nyasaland Railways 3½ per cent debentures were 73½, and the shares have changed hands at 5s. 7¼d.

Engineering shares have been steadier awaiting news whether the first of the steel issues offering steel shares back to investors is to be postponed until September. General assumption is that these shares are not likely to be issued at prices showing yields of less than 7 per cent, and if this proves the case, there may be a fair amount of selling of engineering shares to take up steel shares. Vickers were 48s. 9d., Cammell Laird 5s. shares 11s. 3d., Guest Keen held their rally to 47s. helped by the statements at the recent annual meeting, while T. W. Ward were 71s. 6d. Babcock & Wilcox strengthened to 62s. 9d. Ruston & Hornsby held their rally to 37s. 3d.

Beyer Peacock were 32s. 6d., G. D. Peters 5s. shares 17s., Hurst Nelson eased to 39s. 3d., and North British Locomotive were 13s. Vulcan Foundry were 20s. 3d., Gloucester Wagon 10s. shares 11s. 3d., Wagon Repairs 5s. shares 11s., and Charles Roberts 5s. shares 14s. 4½d. Central Wagon were 67s. 6d.